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Common Mental Health Problems in Later Life: Considering New Approaches to Meet the Challenges of an Ageing Population

THESIS PORTFOLIO

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Doctorate in Clinical Psychology

University of Edinburgh

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OVERVIEW TO THESIS PORTFOLIO

This thesis portfolio has been conducted in part fulfilment of the Doctorate in Clinical Psychology. It comprises two major elements: a systematic review, and an empirical research study. These should be treated as two distinct articles, both aiming to provide insight into the challenges of common mental health problems in later life, and into the potential of new approaches to reducing the disease burden associated with these.

The significant demographic shift towards an ageing population has been well documented and is cause for concern among policy makers and health service providers, as the number of older people using health services, including mental health services will undoubtedly increase. Although the actual prevalence of common mental health problems does not increase in later life, health services are likely to see an increase in older people with depression and anxiety, particularly in the context of chronic physical health conditions. This will be a significant challenge in the current climate of austerity and service redesign.

The current treatment of late life mental health problems has not developed as rapidly or as convincingly in comparison to research in younger people. While psychological therapies have been shown to be as efficacious in older people compared to their younger counterparts, there are a number of specific gerontological issues that must be considered when working with older people. These issues become even more critical in the current context of demographic change.

The current research study explores potential alternative management approaches for common mental health problems in later life. In chapter one a systematic review investigating the efficacy of primary preventive interventions with older people at risk of late life depression and anxiety is presented. This is followed by a research study exploring the relationships between ageing, psychological variables, and psychopathology. Specifically, the study is interested in how factors thought to contribute to successful ageing (selection, optimisation, and compensation theory) and those associated with an acceptance based model (Acceptance and Commitment Therapy), affect the relationship between an individual's perception of their own health, and psychopathology. Chapter two contains the research study entitled 'Psychological Flexibility in an Ageing Population'.

ABSTRACT: THESIS PORTFOLIO

Provisional Question for the thesis to address:

Indicated and selective prevention of common mental health problems in later life: Is there a theoretical rationale for an Acceptance and Commitment Therapy approach?

Background

The burden of late life depression and anxiety is significant. Even subthreshold symptoms result in great individual, community, economic and societal cost. However, common mental health problems in later life are under-recognised and under-treated despite evidence in support of pharmacological and psychological intervention. Previous research regarding psychological therapy for late life mental health problems has been dominated by cognitive behavioural therapy. However, the effectiveness of this approach has been questioned, leading researchers to explore alternative approaches. Acceptance and Commitment Therapy has received increasing attention from researchers keen to explore an alternative and some have argued that this approach is particularly suited to older people. In the context of demographic change and a significant increase in the proportion of community dwelling elderly there is a need to provide evidence to support the use of alternative management strategies for late life mental health problems, for example, focusing on prevention.

Methods

A systematic review will evaluate the current evidence for the use of 'indicated' and 'selective' prevention interventions for older people at risk of developing a major depressive or anxiety disorder due to the experience of subsyndromal symptoms or the presence of significant physical, socioeconomic, and psychosocial risk factors. This paper will be followed by an empirical article in which the relationship between psychological processes and ageing will be explored. Specifically, this study will explore psychological flexibility, the use of Selection, Optimisation and Compensation strategies, and the presence of psychopathology in a non clinical sample of community dwelling older people.

Results

Findings of the systematic review provide preliminary evidence for indicated and selective prevention of late life depression, however there is no clear evidence of benefits of these interventions in late life anxiety. The relationships between variables in the empirical study were

explored using descriptive statistics, correlation analysis, and conditional process modelling. Although the study did not find age to be a specific predictor of variance in psychological variables explored, the study did provide empirical support for the potential to use Acceptance and Commitment Therapy with older people.

Discussion

The systematic review article provided preliminary evidence for the efficacy of selective and indicated prevention interventions for late life depression. However, further research is required to consolidate these findings. The empirical paper found significant relationships between the perception of positive health, reduced psychopathology and theoretical variables including cognitive fusion, engagement in valued living, and the use of Selection, Optimisation, and Compensation strategies. Cognitive fusion was found to mediate these relationships and as such, findings provide support for the use of an Acceptance and Commitment Therapy approach with older people. The theoretical and clinical implications of these findings are discussed in detail.

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PART ONE: SYSTEMATIC REVIEW

Psychological Interventions for the Prevention of Depression and Anxiety Disorders in Later Life:

Who should we target with what Intervention?

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This review has been written in accordance with Clinical Psychology Review (Appendix 1)

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ABSTRACT

Background:

Despite both depression and anxiety being common mental health conditions in older people, the majority of these conditions go unrecognised and untreated. The consequences of untreated depression and anxiety in later life are significant for the individual, and also bear significant costs to health service providers and society alike. Preventative interventions offer an alternative approach to reduce the incidence of common mental health problems and associated disease burden in later life. This review aims to evaluate the efficacy of 'selective' and 'indicated' primary prevention interventions in this context.

Method:

A systematic literature search was conducted using a number of search engines including Medline, Embase, PsycINFO, CINAHL, etc. Inclusion and exclusion criteria are described and included studies were assessed on eleven aspects of methodological quality in line with guidelines from the Cochrane Collaboration and SIGN Guideline Development resources.

Results:

34 studies met inclusion criteria for this review: 29 of which examined preventive interventions for late life depression; 5 examining preventive approaches to anxiety in older people; and 4 studies examined both. Evidence for the efficacy of psychologically based selective and indicated preventive interventions for late life depression was mixed. Empirical support for the prevention of anxiety was found to be less persuasive due to a limited number of interventions addressing this.

Conclusion:

Although the evidence currently does not support the use of preventive interventions for late life anxiety, this review did find provisional empirical support for the use of selective and indicated psychological prevention interventions for older people at risk of depression. However, further research is required to consolidate these findings and provide greater clarity regarding the mechanisms underlying any preventive action.

Keywords:

Prevention, selective, indicated, depression, anxiety, later life, older people

Abstract Word Count: 279

INTRODUCTION

What is Prevention?

In the past twenty years there has been an increased research focus on the prevention, as opposed to the treatment, of mental health problems. Prevention has traditionally been defined according to the public health distinctions of primary, secondary, and tertiary. In this context, primary prevention involves educating the whole population about risk factors and lifestyle changes to reduce incidence of a particular condition. Secondary prevention describes the identification of patients with established risk factors, and the provision of intervention to modify these. Tertiary prevention is the reduction or elimination of disease through the treatment of symptomatic individuals who have been identified after the development of clinical manifestations of disease (IOM, 1994).

However, in 1994, the Institute of Medicine (IOM) introduced a new classification system for prevention interventions, which is based on a risk-benefit perspective (i.e. the risk to an individual of developing clinical manifestations of a disease must be weighted against the cost, risk and discomfort of the potential treatment intervention). This system, initially described by Gordon (1987), maps approximately onto the original IOM public health categories but are instead termed universal, selected, and indicated prevention. A universal prevention approach is one which targets the entire population of interest equally, irrespective of risk of developing a disorder. Indicated prevention involves the identification and targeting of individuals who are at increased risk of developing a disorder due to the presence of early symptoms but who do not meet the diagnostic criteria for the disorder. Selective prevention is targeted towards groups known to be at elevated risk of a disorder due to the presence of known risk factors.

Progress in Prevention Science

The idea of preventing new cases of mental illness has long been considered an important aspect of public health promotion (Jane-Llopis et al., 2003). However, such efforts in the prevention science context have been hindered by a lack of understanding of the complex etiological processes that contribute to the onset of common disorders (Forsman et al., 2010). However, the accumulating research endeavouring to identify risk factors associated with the development of mental illness has facilitated a growing number of research trials examining the feasibility and effectiveness of preventive interventions in high risk groups. Increased risk status typically affects individuals who are experiencing sub-clinical symptoms but who fail to meet full diagnostic criteria for a disorder, or those with the presence of specific risk factors. To date, the conclusions of multiple systematic

reviews offers some promise regarding the feasibility and efficacy of interventions designed to prevent common mental health problems across the age range, with evidence being particularly weighted towards depression (Cuijpers et al., 2008; Forsman et al., 2011; Merry et al, 2011; Munoz et al., 2010; Neil & Christensen, 2009; Stewart-Brown and Schrader-McMillan, 2011; Weare and Nind, 2011).

However, while promising, much of the previous research included in such reviews has focused on prevention in children and adolescents due to the lifelong benefits of such, and the associated cost effectiveness of a prevention approach. Research interest in the potential of preventive interventions to reduce the burden of common mental health problems in later life has only recently come into the spotlight, likely as a result of the significant population shift towards an ageing population. While this demographic change has been attributed to positive changes and improvements in health and social care, developments in technology, and an increase in public health measures (Cuijpers et al., 2010), increased life expectancy brings with it an increase in the number of older people suffering from chronic illness and disability, and social isolation. Both of these are key risk factors for the onset of common mental health disorders such as anxiety and depression. As such, it should be expected that the actual number of older people experiencing these disorders will increase, and it is therefore in the interest of public health, and the economics of mental health service provision to develop preventive interventions in order to reduce the associated disease burden.

Why Prevent Common Mental Health Problems in Older People?

Preventing common mental health problems in later life is important, firstly, because of the associated disease burden. Depression and anxiety are the most common mental illnesses affecting older people (de Beurs et al., 2005; WHO, 2008). Although the prevalence of depression varies considerably between populations of elderly people, data from 74 studies demonstrated a median prevalence rate of depression among older people in Europe of 10.9% (Barua, Ghosh, Kar, & Basilio, 2010). However, subclinical symptoms of these disorders are known to affect many more older people (VanItallie et al., 2005). In addition, certain subpopulations experience inflated prevalence rates. For example, those living in residential care settings, including hospitals and care homes (Jorm, 2000; Krishnan et al, 2002), and those with chronic medical problems (Blazer, 2003), including neurological conditions (Rodda, Walker, & Carter, 2011). Epidemiological studies suggest that anxiety on the other hand, affects approximately 10% of community dwelling older people (Gum et al., 2009; Byers et al., 2010). Further, research has shown that very few older people experience

only depressive or anxiety disorders, without at least some symptoms of the other (Beekman et al, 2000). Subthreshold symptoms are also associated with a range of poor outcomes (Beekman et al., 1999), including decreased quality of life (Smits et al, 2008) and increased health care utilisation (Beekman et al, 1999), particularly when they occur together (Cairney et al., 2008; King-Kallimanis et al., 2009).

A wealth of literature demonstrates the negative outcomes associated with common mental health problems in later life. In all age groups depression has the fourth highest disease burden worldwide and by 2030 it is expected to be number one in developed nations (Cuijpers et al., 2010). It is associated with high levels of service use, increased mortality rates (Cuijpers et al., 2014) and significant economic costs (Smit, Cuijpers et al., 2006). Anxiety disorders can also have serious consequences for recovery from illness (Lenze et al., 2001), and quality of life (Schuurmans et al., 2005), as well as substantially increasing disability levels (Prina et al., 2011). Therefore both depression and anxiety in older adults should be regarded as conditions of great public health importance. Prevention is important due to the limited ability of treatment interventions to reduce this burden (Cuijpers et al., 2010). It is estimated that only 16% of the disease burden of major depression is averted in the current health system (Andrews et al., 2004). If evidence based treatments were provided to all sufferers, this would increase to 34%. However, this leaves a significant proportion highlights the need for alternatives in averting part of this disease burden. ~~(Cuijpers, 2003).~~

This is particularly true of later life, where common mental health problems are chronically undertreated (Blazer, Hybels, Fillenbaum, & Pieper, 2005). Both depression and anxiety (Bryant, 2010) disorders in later life are not recognised and therefore underdiagnosed and inadequately treated (Jeste et al., 2005 and depression . This phenomenon has been attributed to an interacting combination of individual (~~Christensen, Jorm, Mackinnon et al., 1999; Mulsant & Ganguli, 1999)~~, service (~~Baker, 1996; Addonozio, & Alexopolous, 1993),~~ and societal factors (Mitchell et al., 2010; Park & Unutzer, 2011). Where older people do receive an intervention, to date this has relied heavily on pharmacological approaches, which have long since been considered to be efficacious treatments in this population (Beyer et al., 2007; Pinquart & Duberstein, 2007). However, despite seemingly positive empirical support, and guideline endorsement of pharmacotherapy, the challenges associated with treating common mental health problems in this population are often overlooked in this context. In fact, a growing body of research has questioned the safety, acceptability and efficacy of antidepressant treatment in older people (Mitchell & Harvey, 2014) and

the problems associated with polypharmacy are well documented (Kaufman, 2011). Thus, there is a significant need for alternative, non-pharmacological treatment options for older people experiencing common mental health problems.

In a similar thread, empirical literature highlights psychological interventions as a viable treatment alternative for anxiety and depression in later life. The last three decades have seen the development of a relatively robust evidence base supporting the adaption of existing psychotherapies for use with older people (e.g. Cuijpers, Karyotake, Pot, Park, & Reynolds III, 2014; Laidlaw et al, 2008). However, the success of adapting existing psychological interventions has not extended to all pockets of the ageing population. Studies of depression report mixed findings regarding the efficacy of these treatments in sub-populations such as those that are physically unwell or housebound (Ayalon, Fialova, Arean, & Onder, 2010). Similarly, cognitive behavioural approaches for the treatment of late life anxiety have been subject to some suboptimal findings where treatment effects appear to be less than those experienced by younger adults (Thorp et al., 2009; Wetherell, Ruberg, & Petkus, 2010).

Less well developed than in adults of working age, the literature base describing evidence based treatments for common mental health problems in later life is also significantly limited by methodological weakness. Existing data is mostly limited to the healthy younger-old, and there is a significant paucity of information regarding managing depression and anxiety in the oldest old, or those presenting with multiple comorbidities. It is therefore imperative that both existing and novel treatments for common mental health problems are developed and tested specifically for use in the older age range. This may go some way in improving care for older people, and increasing access to preferred treatments in this unique population, however in addition to efficacious treatment, researchers also highlight the importance of preventive efforts in this population (e.g. Jeste et al., 1999).

Therefore, it is clear that there is a crucial need to identify and manage risk factors for common mental health problems in later life. Preventive research is in its infancy in this context, however, to date some recently published reviews have highlighted the potential for preventive interventions in reducing the disease burden associated with late life mental illness. For example, there is evidence for the benefit of psychosocial interventions in supporting positive mental health and increased quality of life in older people (Forsman et al., 2011). Social interventions have also demonstrated preliminary efficacy among this age group (Jane-Llopis et al., 2011a) and other studies have

supported the benefits of physical exercise in preventing depression and anxiety in older people (Windle et al., 2008). However, many of these reviews have highlighted poor quality of included studies, and most have focused solely on depression, despite the significant prevalence of anxiety disorders in the older adult population. Further, with regard to psychosocial interventions, although preliminary findings are encouraging, data are limited and findings to date have been difficult to generalise to the wider population and have been challenging for services to implement in clinical practice (Forsman, Schierenbeck, & Wahlbeck, 2011).

Rationale and Aims of the Current Review

Given the significant prevalence of depression and anxiety disorders in community dwelling elders, and the adverse outcomes associated, even with sub-threshold symptoms, the World Health Organisation highlight the need for effective healthcare models for this unique and growing population (WHO, 2008). Within this context, common mental health problems in later life are of particular interest to researchers and policy makers as although the incidence of serious mental illness is thought to reduce with age, the actual number of older adults experiencing common psychological disorders will inevitably rise as a consequence of the changing demographic (Blazer, 2003; Schutzer and Graves, 2004).

An effective preventive strategy should ideally be developed to address factors that are known to be causally related to the experience of these disorders in older people as these may be different from those in the population of adults of working age (Almeida, 2012). Recent pragmatic approaches to the prevention of depression in later life have involved individuals with sub threshold symptoms as opposed to those who meet the criteria for diagnosis of a depressive disorder (Lyness, Yu, Tang et al., 2009). Previous literature suggests that prevention interventions aimed at older people with sub-threshold disorders can reduce the incidence of depression and anxiety where interventions are well designed (Sriwattanakomen, Ford, Thomas, et al., 2008)

Unfortunately, studies investigating preventive interventions in the ageing population are significantly limited in comparison to those that have demonstrated efficacy in reducing depression and anxiety symptoms in adults of working age (Jane-Llopis, Hosman, Jenkins, & Anderson, 2003). Those studies which do exist are often limited due to methodological shortcomings, and previous reviews and meta-analyses (Forsman et al., 2011) are thus unable to provide clarity regarding the efficacy of preventive interventions in this population as a result of this.

In order to clarify these issues, the current review aims to systematically evaluate the empirical evidence assessing the effectiveness of psychological interventions in the indicated and selective prevention of depressive and anxiety disorders in individuals over the age of 65. This study also aims to address limitations highlighted from a previous review and meta-analysis (Forsman et al., 2011) which assessed the effectiveness of psychosocial interventions in the primary prevention of depressive symptoms and unipolar depressive disorders in older people. This study, like many others, failed to address the significant burden of anxiety disorders in older people. As depression and anxiety are so often comorbid conditions in later life, failure to address preventive interventions targeting anxiety symptoms is a significant shortcoming. Forsman et al. (2011) also did not differentiate between indicated and selective primary interventions in their systematic review and meta-analysis and the wide inclusion criteria regarding the type of studies included made it difficult to draw any clear conclusions regarding the efficacy of psychological approaches.

Therefore, the current review will endeavour to separate out the evidence for interventions targeting indicated and selective interventions in order to consider what works best for whom under what circumstances. The current review also aims to consider economic data in order to shed some light on the cost effectiveness of preventive interventions in older people. It is thought that by providing this additional information, policy makers and service providers will have more relevant evidence regarding the provision of preventive interventions for common mental health problems in older people.

METHODOLOGY

Aim

The aim of this systematic review is to investigate the efficacy of 'selective' and 'indicated' primary prevention interventions for late life (age 65 and over) depression and anxiety disorders.

Search Methodology

In order to identify relevant papers a systematic literature search involving five key steps was conducted:

1. Initially 11 data bases were searched until the 20th August 2015. These included AgeLine, ASSIA, CENTRAL, Cinahil, Embase, ERIC, Medline, OpenSIGLE, PsycINFO, Web of Science, and the Cochrane Library. Searches of these databases were conducted by combining search terms indicative of 'prevention' and 'depressive disorder' or 'anxiety disorder' in 'later life' (details in table 1). Following this studies involving major meta-analyses and reviews of studies evaluating preventive interventions in older people with subclinical depression or anxiety symptoms were collected. This was achieved by examining the same bibliographical databases outlined above but specifically searching for reviews and meta-analyses, combining these key words with the search terms above.
2. In addition, hand searching of the following journals was conducted, covering issues from 2000 to 2015: the Gerontologist and the Journal of the American Geriatrics society.
3. Studies returned from searches were screened for relevance according to their title and abstract and if they could not be excluded from this information alone, they were examined more extensively to determine whether or not they met the inclusion and exclusion criteria outlined below. Available data were extracted and coded by the primary author according to information on study design and origin, study participants, intervention content and outcomes measured.
4. The final step of the search methodology involved the manual searching and examination of reference lists of included studies collected through methods outlined in stage one and two. Again studies that possibly met inclusion criteria were retrieved and examined for possible inclusion.
5. Following this, grey literature was examined for unpublished studies relevant to the review.

Table 1: Key words and search terms applied

Population/Target Group	Problem Area	Prevention/Promotion Topic	Intervention/Method	Type of Article
Core Search Terms Older$ Elder$ Senior$ Geriatric Aged	Psychosocial Mental Health	Mental Health Depression Anxiety Behaviour$ Behavior$	Promot$ Prevent$ Support Self Help Educat$ Strateg$	Review Overview Evaluation Intervention

Inclusion Criteria

Studies were included in the review when they employed a pre-test post-test design and examined the effects of a preventive psychological intervention, targeting the incidence of new cases of depression or anxiety disorders in older people (aged 65 or over, or where the average age of participants is 65 or over), in comparison with a control group. In this context prevention was defined as reducing the incidence of new cases of depressive or anxiety disorders. Therefore, trial participants must not meet the diagnostic criteria for a depressive or anxiety disorder at the time of enrolment in the study (according to the International Statistical Classification of Diseases and Related Health Problems (ICD) or Diagnostic and statistical Manual of Mental Disorders (DSM) or according to depression or anxiety rating scales if ICD or DSM criteria was not used). The study definition of clinically relevant depressive or anxiety symptoms are those which reach a cut-off point on a self-rating depression or anxiety questionnaire; a score above a cut-off point on a clinician rated instrument; or meeting criteria for major depression according to the criteria described in the DSM or ICD. Psychological interventions were defined as any intervention that emphasises psychological functioning, where interventions were based on psychological theory, rather than biological factors (Ruddy & House, 2005). This definition allows for the inclusion of psychological therapies and health education. The psychological intervention could appear in any format e.g. in groups or individually, as long as they were described in enough detail that would allow for replication. Only studies employing a 'selective prevention' or 'indicated prevention' approach were included. Trials considered for this review had depressive and anxiety symptoms, or depression or anxiety diagnoses as a measured outcome. No language restrictions were applied. Studies were also included if they failed to meet these inclusion criteria but participants were stratified during randomisation and the results were specifically reported for older adults, with sub-threshold symptoms of depression or anxiety. Trials were included regardless of setting, that is, institution or community.

Exclusion Criteria

Studies which met these criteria were only included in the review if they had been published after 1980 due to the fact that most modern diagnostic definitions of mental disorders such as the DSM and ICD were not broadly used before this date. All studies where the participants suffered from a diagnosed mental health condition at baseline, including anxiety or depression symptoms warranting a diagnosis of a major disorder, or those who suffered from significant cognitive decline (e.g. severe dementia) were excluded from the review. Individuals with severe dementia were excluded by way of recruitment strategy (e.g. not recruiting in residential or nursing homes) as it was presumed that these individuals would, (a) be unlikely to continue to be community dwelling, and (b) would be unlikely to offer informed consent regarding participation. Interventions with primarily a physiological component in addition to a psychological component (e.g. exercise groups for older people) were not considered. However, trials including physiological components secondary to those based in psychological theory e.g. breathing exercises in cognitive behavioural anxiety management, were included. All trials of secondary or tertiary prevention interventions, relapse prevention, and pharmacological interventions were excluded.

All abstracts of the publications retrieved from the search strategy were screened for inclusion by the primary author. Studies that potentially met inclusion criteria, studies without a clear abstract, and studies that could not be clearly excluded were examined more extensively and full text versions were screened. In addition, book chapters, review papers, and editorials not reporting study data were excluded.

Outcomes Measured

The primary outcome of this review was the occurrence of depression, anxiety and depressive or anxiety symptoms, as measured by depression and anxiety rating scales or by diagnostic interview criteria (such as the Geriatric Depression Scale, Geriatric Anxiety Scale, Hospital Anxiety and Depression Scale, etc). The outcome measures were recorded either immediately after the intervention or at the end of a specified follow up period in addition to post intervention.

Quality Assessment

All publications retrieved from the databases were screened for inclusion by the first author and available data were extracted and coded. The methodological quality of studies which met the inclusion criteria was assessed and rated according to criteria developed based on the SIGN 50 (2011) guidelines, and adapted to the needs of the current review question. The PRISMA statement

(Liberati et al., 2009) for reporting systematic reviews was also consulted. It states that the assessment of risk of bias should be addressed using standardised criteria, which may be adapted depending on the nature of included studies. The quality criteria used in this systematic review are presented in Table 2 below.

Table 2: Quality Assessment Criteria

Quality Criteria	Description	Rating
Study Design	Experimental – RCT	Well Covered (3)
	Experimental - Non Randomised Controlled Trial	Adequate (2)
	Observational - Before and after (uncontrolled trial)	Poor (1)
	Observational - Case Studies	Very Poor (0)
Sampling method ensures that the sample selected is representative of the wider older adult population at risk of depression or anxiety due to the presence of risk factors of subsyndromal symptoms and thus is generalizable.	Sampling methods is clearly reported and ensures that minimal bias is introduced and appropriate inclusion and exclusion criteria are applied e.g. random sequencing used.	Well Covered (3)
	Sampling method may introduce an element of bias and inclusion/exclusion criteria are appropriate.	Adequate (2)
	Sampling method may introduce significant bias. Inclusion/exclusion poorly defined.	Poor (1)
	Sampling method not reported, inclusion and exclusion criteria not reported.	Very Poor (0)
Population appropriately described and baseline demographic and clinical characteristics of participants are clearly stated and representative of the wider population of older people at risk of depression or anxiety.	Population clearly described and appropriate to research question. Baseline and clinical characteristics well described e.g. age, gender, no diagnosis of major depressive or anxiety disorder and representative of the older adult population.	Well covered (3)
	Adequate description of baseline demographic and clinical characteristics – at least 2 described and are representative of wider older adult population.	Adequate (2)
	One or no baseline demographic or clinical characteristics described or are not representative of the population.	Poor (1)
	Population not addressed.	Not addressed (0)
Appropriate and clearly randomised control group.	Random allocation, investigator(s) blinded; treatment and control groups comparable at the start of trial,	Well covered (3)
	Control groups adequately randomised or groups not comparable.	Adequate (2)
	Control group inappropriate or not randomised.	Poor (1)
	No control group.	Not addressed (0)
Intervention clearly described to ensure reliability and external validity of	Intervention clearly described, treatment protocols followed which are replicable. Study ensures external validity of intervention.	Well covered (3)
	Intervention adequately described or no treatment protocols used.	Adequate (2)

therapy.	Intervention poorly described or poor validity of therapy.	Poor (1)
	Intervention not described or inappropriate intervention used.	Not addressed (0)
Intervention appropriately conduced to ensure internal validity and treatment fidelity.	Intervention delivered by trained professional, intervention is manualised, or other clear measures to ensure fidelity.	Well covered (3)
	Intervention carried out by trained professional and only adequate attempts to ensure fidelity e.g. some form of monitoring on a percentage of sessions.	Adequate (2)
	Intervention not carried out by a trained professional or no attempts made to ensure fidelity.	Poor (1)
	Information on therapist(s) or treatment fidelity not provided.	Not addressed (0)
Use of appropriate and standardised outcome measures that are valid and reliable for measuring depression and anxiety in older people.	All depression outcome measures appropriate, valid, reliable and standardised and have been validated for use with older people. All anxiety outcome measures appropriate, valid, reliable and standardised and have been validated for use with older people.	Well covered (3)
	All measures valid reliable and standardised but not validated for use with an older adult population.	Adequate (2)
	Most (more than 50%) depression and anxiety measures are appropriate and standardised.	Poor (1)
	Inappropriate measures of depression and anxiety used.	Not addressed (0)
Appropriate diagnostic tool used at baseline, end of treatment and follow up to determine the presence of a major depressive or anxiety disorder.	ICD or DSM diagnostic tools used at pre, post and follow up e.g. SCID.	Well covered (3)
	Other standardised diagnostic tool used at pre, post and follow up e.g. MINI.	Adequate (2)
	Measures of depression or anxiety used at pre, post and follow up e.g. GDS, HADS-A.	Poor (1)
	No appropriate diagnostic tools used.	Not addressed (0)
Attrition rate. **Study clearly indicates the number of participants invited to take part in the research and states attrition rates clearly. Attrition rates are similar for each group.**	Details clearly provided regarding the number of people invited to participate, opt in rates and dropout rates throughout the study process. Attrition rates are similar for each group (within 20% of each other)	Well covered (3)
	Details clearly provided regarding at least two of the following: number invited to participate, opt in rate, dropout rate. Attrition rates are similar for each group (within 20% - 30% of each other)	Adequate (2)
	Insufficient detail given on less than two of the following: number invited to participate, opt in rate, dropout rate. Attrition rates are similar for each group (within 30% more than % of each other)	Poor (1)
	Attrition not addressed.	Not addressed (0)
	Number of participants sufficient to enable power of at least 0.8 where the effect size was medium and the alpha was set at 0.5.	Well covered (3)

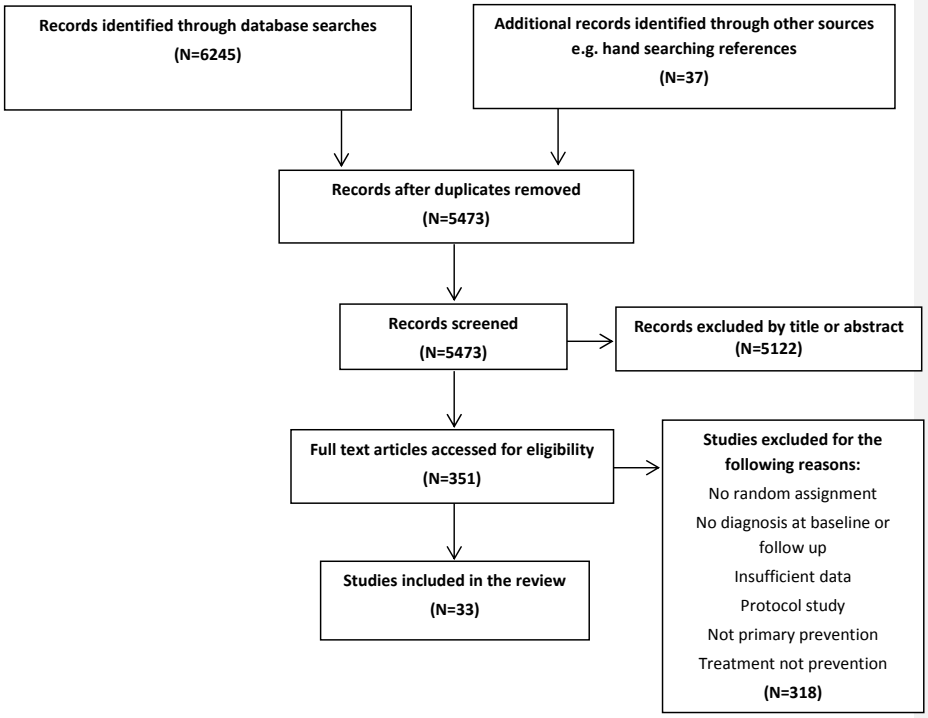
Sample size and power. Sample size was sufficient for analysis relating to presence of major depression or anxiety disorders.	Participants needed = 51 per condition.	
	Number of participants sufficient to enable power of at least 0.7 where the effect size was medium and the alpha was set at 0.5. Participants needed = 39 per condition.	Adequate (2)
	Number of participants sufficient to enable power of below 0.7 where the effect size was medium and the alpha was set at 0.5. Less than 39 participants per condition.	Poor (1)
	Sample size and power not addressed.	Not addressed (0)
Appropriate and clearly reported statistical analysis.	Statistical analysis appropriate to the study design and clearly reported allowing for replication. Appropriate statistical method used to deal with missing data e.g. ITT with baseline score carried forward to minimise bias.	Well covered (3)
	Statistical analysis appropriate to the study design and clearly reported. No statistical method to deal with missing data but proportion of participants excluded from analysis reported and is less than 20%.	Adequate (2)
	Statistical analysis inappropriate to the study design or not clearly reported. Poor method used to deal with missing data.	Poor (1)
	Statistical analysis not carried out or not reported. 11	Not addressed (0)
Follow up measures administered	Follow up measures >12 months.	Well covered (3)
	Follow up measures > 6 months	Adequate (2)
	Follow up measures < 6 months	Poor (1)
	No follow up measures taken.	Not addressed (0)

RESULTS

Search Strategy

The search strategy yielded 5473 hits from all databases examined after duplicates were removed. Titles and abstracts of retrieved studies were then screened according to the inclusion criteria and those that were irrelevant were excluded at this point. This resulted in 212 studies still remaining. Full copies of these studies were analysed according to the inclusion and exclusion criteria, and having checked these in detail, the number of included studies was reduced to 34. Twenty-nine studies addressing depression, and five addressing anxiety in later life. The primary reasons for exclusion of retrieved publications at this point included failure to meet the inclusion criteria for participant age (i.e. over 65 years or a mean age of over 65 years), failure to screen for depressive or anxiety disorders at baseline, or that the publication was reporting the result of a feasibility study or study protocol. Figure 1 outlines the outcome of the search strategy diagrammatically.

Figure 1 – Search Strategy and Study Inclusion



Characteristics of Included Studies

The characteristics of included studies are described in Table 3 below.

Of the 33 studies included in the review, the majority (n=30) were randomised controlled trials with only a few using pre-test post-test experimental designs (n=3). Two types of primary prevention interventions were used in included studies: selected, and indicated prevention. A wide range of assessment scales were used to measure clinical characteristics and trial outcomes.

Depression

In measuring depression symptoms and depressive disorders the following were used: the Beck Depression Inventory (n=5 ; BDI); the Centre for Epidemiologic Studies Depression Scale (n=9 ; CES-D); the Geriatric Depression Scale (n=9; GDS); the Hamilton Depression Rating Scale (n=2; HDRS); the MINI psychiatric interview (n=3; MINI); the Montgomery and Asberg Depression Rating Scale (n=1; MADRS); the Hospital Anxiety and Depression Scale (n=2; HADS); the Patient Health Quesitonnaire-9 (n=1; PHQ-9); the Structured Clinical Interview for DSM Disorders (n=4; SCID); the Zung Depression Scale (n=2; ZDS).

Of the 28 studies examining preventive interventions for depression in later life, 11 investigated indicated prevention interventions in samples of individuals with subclinical symptoms of depression. 17 studies employed a selective preventive intervention procedure targeting groups of older people due to the presence of known risk factors. These studies employed samples of older people with risk factors including physical health and disability, for example people with macular degeneration, or those who had experienced a stroke. They also looked at sociodemographic variables such as caregiver status, and institutionalisation e.g. nursing or residential home placement.

Anxiety

In measuring anxiety symptoms and disorders, the following standardised assessment measures were used: the Hospital Anxiety and Depression Scale-Anxiety (n=3; HADS-A), the MINI neuropsychiatric Interview (n=1; MINI); the Short Health Anxiety Inventory (n=1; SHAI).

Of the five studies investigating preventive interventions for late life anxiety disorders, four studies evaluated indicated prevention in the treatment of individuals with subclinical symptoms of anxiety. This included specific forms of anxiety disorder, such as hypochondriasis. Only one study evaluated a selective prevention intervention in a group of older people known to be at increased risk of anxiety due to institutionalisation/nursing home placement

Table 3 – Characteristics of Included Studies

Author	Design Selective or Indicated Prevention?	Active Intervention	Active Intervention Participants	Control Participants	Relevant Outcome Measures	Follow Up Measures Taken	Results	Quality Scoring and Rating
DEPRESSION STUDIES (Indicated Prevention)								
Bosemans et al. (2014). Netherlands	Economic Evaluation based on RCT Indicated	Stepped care: watchful waiting, activity scheduling, life review, GP consultation.	N=93 (mean age: 84) 67% female	N=92 (mean age: 84) 68% female	CES-D HADS	10 months	The incidence of major depression was halved in the intervention (0.09) compared to control group (0.17) (-0.08; -0.21, 0.04). Costs in intervention group were higher than usual care group but this was not significant.	28 Good
Haight et al. (1992). USA	Experimental Pre-test Post-test Indicated	Life review process: 6 1 hour visits	N=10 (mean age:76) 78% female	N=12 (mean age:76) 78% female	ZDS	Post Intervention	Significant difference between life intervention group and controls $F = 9.90$, $p < .003$	18 Poor
Mastel-Smith et al. (2007) USA	RCT Indicated	Life Review Intervention – 10x 2 hour life story workshops.	N=15 (mean age:70.1) 81% female	N=16 (mean age:72.7) 81% female	BDI	Post Intervention	There was no difference in depression scores between the intervention and control groups. BDI t (19.26) = –2.277, p = .036	16 Poor
Reynolds et al. (2014). USA	RCT Indicated	Problem Solving Therapy for Primary Care – 6 to 8 sessions and semi-annual boosters.	N=125 (mean age 65.8) 69% female	N=122 (mean age 65.4) 74% female	BDI CES-D SCID	24 months	Both groups experienced a 4 point drop on the BDI which was sustained at 2 year follow up but results only preliminary due to lack of TAU control. beta = −.030, t(799)=−9.80, p<.001	28 Good
Scogin et al. (1989). USA	RCT Indicated	Cognitive or behavioural bibliotherapy	Behavioural N=23 (mean age: 70.3) 78.2% female	N=22 (mean age: 67.8) 86.3% female	HDRS	6 months	Both cognitive and behavioural bibliotherapy were superior to control conditions. Treatment gains were maintained at 6m follow up. *Cognitive - F(*\, 40) = 25.65, p < .05.	20 Poor

			Cognitive N=22 (mean age: 66.7) 90.1% female				Behavioural - significant Group X Time interaction was observed, *F(6,* 26) = 3.98, *p* < .01	
Stahl et al. (2014). USA	RCT Indicated	Coaching in healthy dietary practices.	N=122 (mean age: 65.6) 78% female	Not stated (mean age: 65.6) 78% female	BDI	24 months	Participants in the intervention group experienced a lower incidence of MDD and exhibited 40-50% less depressive symptoms than control during the 6 week intervention. Gains sustained over 2 years.	23 Good
Van der Weele et al. (2012). Netherlands	RCT Indicated	Stepped care: Individual counselling, Coping with depression course, referral back to GP.	N=121 (mean age: 80) 70% female	N=118 (mean age: 80) 75% female	MADRS GDS	6 months 12 months	At 6m MADRS scores had improved more in the intervention group than the usual care group. (−2.9 versus −1.1 points, P = 0.032), but not at 12 months (−3.1 versus −4.6, P = 0.084).	27 Good
v'ant Veer-Tazelaar et al. (2009). (2010) (2011) Netherlands	RCT Cost Effective Analysis 2 year follow up Indicated	Stepped care: Watchful waiting, bibliotherapy, PST, consultation with GP.	N=86 (mean age 81.8) 60% female	N=84 (mean age 81.1) 65% female	CES-D MINI	12 months	Intervention halved the 12 months incidence of depressive disorders. from 0.24 (20 of 84) in the usual care group to 0.12 (10 of 86) in the stepped-care group (relative risk, 0.49; 95% confidence interval, 0.24 to 0.98). Intervention shown to be cost effective. Effects sustained at 24m follow up	30 Excellent
Wahl et al. (2006). Germany	Pre-test Post-test Indicated	Emotion focussed therapy – 5 weekly group sessions Problem focussed therapy – 5 weekly group sessions	N=23 (mean age:76.5) 90% female N=22 (mean age:76.6) 68% female	N=22 (mean age:77.3) 77% female	GDS	2 months	Emotion focused therapy resulted in a small significant reduction in depression scores in comparison to problem solving therapy and control. Emotion focused group -0.55 (p=.047, effect size 2.7)	17 Poor
Walker et al. (2010)	RCT Indicated	Mental Health Literacy Training – 10 sessions over 24 months	N=452 (mean age 66.1) 59.7% female	N=448 (mean age 65.8) 60.7% female	PHQ9	Post Intervention	At six weeks depressive symptoms were lower for the mental health literacy intervention compared with	19 Poor

Australia							its control condition (t(895) = 2.04, P = 0.042).	
DEPRESSION STUDIES (Selective Prevention)								
Birk et al. (2004). Germany	Randomised pre-post intervention design. Selective	Psychological programme involving 6 modules over 5 weeks: relaxation, CBT, resources and coping etc.	N=14 (mean age:73.1)	N=8 (mean age:72.6)	GDS	Post intervention.	Participants in the intervention group experienced a larger decrease in depressive symptoms vs control group. Change in depression scores was significant (t=1.98: p=.06) and the effect size was 0.88.	17 Poor
Boen et al. (2012) Norway	RCT Selective	Senior Centre Group Program.	N=77 Over 65s - average age not reported 59.5% female	N=61 Over 65s - average age not reported 59.5% female	BDI	12 months	Intervention did not reduce depression incidence. BDI symptoms intervention vs control mean change 0.74 (SD= 4.72) effect size (d=0.03).	26 Good
Burns et al. (2007) England	RCT Selective	CBT (up to 7 sessions with assistant psychologist)	N=85 (mean age 80.8) 66% female	N=85 (mean age 79.0) 67% female	GDS HADS	6 months	No significant difference in incidence depression between CBT and TAU (p=0.10).	28 Good
Dozeman et al. (2011). Netherlands	RCT Selective	Guided self-help intervention on activity scheduling	N=67 (mean age 83.7) 46% female	N=62 (mean age 84.2) 50% female	CES-D	Post Intervention	No statistically significant difference due to significant drop out. Cohen's D = .60 for depression symptoms.	27 Good
Dozeman et al. (2012). Netherlands	RCT Selective	Stepped care intervention: watchful waiting, self-help, life review, consultation with GP	N=93 (mean age 84.5) 67% female	N=92 (mean age 84.2) 67% female	CES-D	10 months	Statistically significant – adjusted risk of MDD during intervention was 74% lower than TAU (SE = 0.11, z = –3.13, p < 0.01).	27 Good
Haight et al. (1998). (2000) USA	RCT (1998) 3 year follow up (2000) Selective	Life review course – 6 weeks.	N=64 Age range 60-104 N=29 (mean age:79.6) 69% female	N=64 Age range 60-104 N=23 (mean age:79.6) 69% female	BDI	12 months 3 years	Significant decrease in depression symptoms at post test and 1 year follow up in intervention group vs control (p=0.05) Continued and by year 3 significant improvement in those who received life review on measure of depression (t=-2.20, p<0.03).	25 Good

Joling et al. (2011) Netherlands	RCT Selective	CBT based Bibliotherapy	N=86 (mean age 81.3) 60% female	N=84 (mean age 81.1) 65% female	CES-D	Post Intervention	No statistically significant difference between bibliotherapy and TAU OR = 0.86, 95% CI: 0.447–1.657, *t* for beta 0 = −0.38 with 81 adjusted *df*, p = 0.704 .	25 Good
Joling et al. (2012) (2013) Netherlands	RCT (2012) Economic Evaluation (2013) Selective	2 individual counselling sessions and 4 family meetings.	N=96 (mean age: 67.8) 67% female	N=96 (mean age: 71.2) 68% female	MINI CES-D	12 months	The intervention was not superior to usual care in reducing the risk of depression onset or in reducing depression symptoms. Depression adjusted IRR 0.98; 95% CI 0.69 to 1.38 No significant differences in costs were found between the intervention group and usual care.	29 Good
Konnert et al. (2009) Canada	RCT Selective	13 weeks of CBT based Coping with Stress Package	N=20 (mean age 81.1) 77% female	N=23 (mean age 81.1) 77% female	GDS CES-D	3 months 6 months	CBT improved GDS scores vs control group which was maintained at 6m follow up. F (1, 33) = 3.56, p=0.068.	30 Excellent
Mossey et al. (1996). USA	RCT Selective	Interpersonal counselling	N=35 (mean age: 71) 78.2% female	N=41 (mean age: 71) 78.2% female	GDS SCID	3months 6months 12months	Individuals in the intervention group showed a statistically significant improvement compared to usual care at 6m. F=3.20 P=0.29 3 month F=5.64 p=0.01 (6 month)	21 Good
Phillips et al. (2000) USA	RCT Selective	Education/Pain management programme	N=101 (mean age: 69.3) 60% female	N=101 (mean age: 69.3) 60% female	CES-D	12 months.	Post treatment the intervention group was significantly less likely to have developed clinical depression than the controls. This difference was maintained at 12m follow up.	17 Poor
Robinson et al. (2008). USA	RCT Selective	Problem solving therapy group.	N=59 (mean age: 67.3) 49% female	N=58 (mean age: 63.9) 36% female	SCID	Post intervention .	Patients who received PST were less likely than placebo control to develop minor or major depression. PST vs placebo 30.5% vs 34.5%;adjustedHR,1.1; 95%CI,0.8-1.5;	26 Good

							P=.51	
Romeo et al. (2011). England	Cost effective analysis and RCT Selective	CBT – 6 sessions administered by an assistant psychologist	N=85 (mean age 79) 79% female	N=85 (mean age 80.8) 78% female	GDS HADS	Post Intervention	No significant differences in depression score or cost between CBT or TAU groups (4; 6%) compared with patients in the TAU group (11; 15%) (p=0.10).	28 Good
Rovner et al. (2007) Rovner & Casten (2008) USA	RCT Selective	Problem Solving Therapy – 6 individual sessions over 8 weeks	N=105 (mean age:81.3) 65.7% female	N=101 (mean age: 81) 74.3% female	SCID HDRS	2 months 6 months	The 2-month incidence rate of depressive disorders in problem-solving–treated subjects was significantly lower than controls (11.6% vs 23.2%, respectively; odds ratio, 0.39; 95% confidence interval, 0.17- 0.92; *P*=.03) but effects diminished by 6m.	23 Good
Rybarczyk et al. (2001). USA	RCT Selective	Mind/body wellness course, CBT.	N=113 (mean age: 67.6) 80.4% female	N=130 (mean age: 64.8) 80.7% female	CES-D	12 months	No significant difference in depression scores in the intervention vs control group at 1 year follow up. BAþLVR subjects (12.6%) and 18 STþLVR subjects (23.4%) developed a depressive disorder (relative risk [RR], 0.54; 95% CI, 0.27, 1.06; P= 0.067).	25 Good
Salminen et al. (2005). Finland	RCT Selective	16 month Health advocacy and counselling program.	N=116 (mean age: 72.5) 51% female	N=106 (mean age: 72.6) 52% female	ZDS	Post intervention .	Depressive symptoms decreased in the intervention group vs control but only for men. Mean difference = 0.0 (IQr=6)_ P = 0.513	19 Poor
Saito et al. (2012) Japan	RCT Selective	Social isolation prevention program.	N=20 (mean age: 72.6) 60% female	N=40 (mean age: 72.8) 70% female	GDS	6 months	No significant association was found with the intervention and depressive symptoms.	20 Poor
Van Schaik et al. (2013). Netherlands	RCT Selective	Stepped care: Watchful waiting, self-help, life review, consultation with GP.	N=93 (mean age: 84.5) 67% female	N=92 (mean age: 84.2) 68% female	MINI CES-D	24 months	The incidence of MDD was not reduced in the intervention vs control group at 24m.	26 Good

ANXIETY STUDIES (Indicated Prevention)								
Bourgault-Fagnou & Hadjistavropoulos. (2013) Canada	RCT Indicated	Enhanced and standard CBT for subclinical health anxiety – 6 sessions.	SCBT N=21 (mean age: 69) 76.2% female ECBT N=18 (mean age: 68.1) 66.7% female.	N=18 (mean age: 68.8) 88.9% female	SHAI WI STAI	3 months.	At post treatment participants in SCBT and ECBT groups showed significantly lower health anxiety compared to waiting list control. Significant effect on hypochondriasis (F= 17.59; p=0.001) and fear/phobia symptoms (F=15.46; p=0.002)	19 Poor
Dozeman et al. (2011). Netherlands	RCT Indicated	Guided self-help intervention on activity scheduling	N=67 (mean age 83.7) 46% female	N=62 (mean age 84.2) 50% female	HADS-A	Post Intervention	No statistically significant difference due to significant drop out. Cohen's D =.48 for anxiety.	27 Good
Dozeman et al. (2012). Netherlands	RCT Indicated	Stepped care intervention: watchful waiting, self-help, life review, consultation with GP	N=93 (mean age 84.5) 67% female	N=92 (mean age 84.2) 67% female	HADS-A	10 months	Not effective in reducing incidence of anxiety. (SE = 0.68, z = 0.53, p = 0.60).	27 Good
v'ant Veer-Tazelaar et al. (2009). (2010) (2011) Netherlands	RCT Economic Evaluation 2 year follow up Indicated	Stepped care: Watchful waiting, bibliotherapy, PST, consultation with GP.	N=86 (mean age 81.8) 60% female	N=84 (mean age 81.1) 65% female	MINI	12 months 24 months	12-month incidence of depressive and anxiety disorders, from 0.24 (20 of 84) in the usual care group to 0.12 (10 of 86) in the stepped-care group (relative risk, 0.49; 95% confidence interval, 0.24 to 0.98). Intervention shown to be cost effective. Effects sustained at 24m follow up	30 Excellent
ANXIETY STUDIES (Selective Prevention)								
Joling et al. (2012) (2013) Netherlands	RCT Economic Evaluation Selective	2 individual counselling sessions and 4 family meetings.	N=96 (mean age: 67.8) 67% female	N=96 (mean age: 71.2) 68% female	HADS-A	12 months	The intervention was not superior to usual care in reducing the risk of anxiety onset or in reducing anxiety symptoms. Anxiety randomization-by-time interaction coefficient =20.55; 95% CI 21.59 to 0.49. No significant differences in costs were found between the	29 Good

							intervention group and usual care.	

Quality of Included Studies

The studies included in this review were subject to rigorous quality assessment procedures using a quality criteria developed specifically for the purpose of this study. The development of quality criteria was based on guidance based on guideline development resources (SIGN 50, 2012). From this a quality assessment tool was developed specifically for the purpose of this systematic review. The quality assessment tool included eleven different aspects of methodological rigour which each included study was assessed on. A quality score ranging from three (well covered) to zero (not addressed) was assigned for each of the eleven individual quality domains, giving a summed total score out of a possible 36 (see table 4 for details). These total scores were then categorised with a qualitative descriptor rating as previous research has highlighted that numerical rating of methodological quality can be misleading when conducting systematic reviews (Liberati et al., 2009). Therefore, each study was also categorised by total score as follows: poor 0-20; good 21-29; excellent 30-36.

The issue of numerical ratings tends to be an issue in reviews in which studies score notably differently on one or more important quality criteria than they do on less important ones. The key quality criteria in the current study included the overall design of the study including the allocation of participants; provision of a clear control group; similar participant characteristics at baseline; and measures to ensure internal and external validity of the intervention. The study design, allocation, and participant characteristics are of particular importance in this case due to the strict inclusion and exclusion applied. Randomisation of participants, and similar baseline characteristics reduce the risk of bias influencing the interpretation of results and by minimising such bias it ensures that any treatment effect is more likely to have been caused by the intervention as opposed to some other factor. Further, as the review is interested in preventive interventions, and the comparison of these, an essential quality criteria included the adequate description of an intervention and measures to ensure the internal and external validity of an intervention. Again this allows findings to be interpreted in such a way that reduces the risk that other factors are responsible for intervention effects. It also means that any study can be replicated in other populations or larger samples in future research. In the current review, the quality categories which were found to lie below the mean level across all categories, for all studies, were intervention validity, treatment fidelity, use of an appropriate diagnostic tool, statistical reporting and follow up period. In the studies included in the review, the one category in which studies tended to score poorly, despite scoring well on other criteria, was treatment fidelity. This suggests that results must be interpreted with caution, as it is

questionable whether the intended intervention was actually delivered, and confidence in the quality of the intervention is reduced.

Prevention of Depression

Indicated prevention

Of the studies examining the effects of psychologically based indicated interventions for the prevention of late life depression, six were found to have poor methodological rigour and therefore their findings were not incorporated into the narrative synthesis of evidence in this review (Birk et al, 2004; Haight et al., 1992; Mastel-Smith et al., 2007; Scogin et al., 1989; Wahl et al., 2006; Walker et al., 2010). One study was found to be of excellent methodological quality (van't Veer-Tazelaar et al., 2009), and the final five were rated as 'good' (Bosemans et al., 2014; Reynolds et al., 2014; Stahl et al., 2014; van der Weele et al., 2012).

Three studies investigated the effects of stepped care interventions in preventing late life depression in older people with subthreshold symptoms. Although the specific steps in each intervention varied slightly, each included an initial watchful waiting period, followed by a self help-type step, followed by a group based psychological intervention, and finally a consultation with a GP. Investigating life review therapy as the major psychological component of the intervention, Boseman and colleagues (2014) found their intervention to be effective in significantly reducing the symptoms of depression in comparison to treatment as usual control. They were also able to provide data that suggests the intervention can be delivered for costs similar to that, but not significantly cheaper than, treatment as usual. Another study opted for a CBT based 'coping with depression' course as the main psychological component in their intervention (van der Weele et al., 2012). Depression symptoms had significantly improved at six month follow up in comparison to a usual care group. Finally, evaluating problem solving therapy as the key psychological therapy step of their intervention, van't Veer-Tazelaar and colleagues demonstrated that their stepped care intervention halved the 12 month incidence of depressive disorders. In a follow up paper they also demonstrated that their intervention was cost effective in comparison to control (van't Veer-Tazelaar et al., 2010) and results were maintained at 24 month follow up (van't Veer-Tazellar et al., 2011).

In studies which did not follow a stepped care protocol, Reynolds and colleagues (2014) demonstrated that six to eight sessions of problem solving therapy with bi-annual refreshers resulted in a significant reduction in depression scores, which were maintained at two year follow up. However, the lack of treatment as usual control group in this instance means that results should

only be considered as preliminary. Stahl and colleagues (2014) evaluated a lifestyle coaching intervention and demonstrated that coaching in healthy dietary practices resulted in a reduced incidence of major depressive disorder, and a 40-50% drop in depressive symptoms in the intervention group vs care as usual control. These findings were sustained at 24 month follow up.

Selective Prevention

Of the 18 studies assessing selective preventive interventions in late life depression, five were found to be of poor methodological quality and as such their findings were not incorporated into the narrative synthesis of evidence in this review (Birk et al., 2004; Mossey et al., 1996; Phillips et al., 2000; Saito et al., 2012; Salminen et al., 2005). Twelve studies fell within the 'good' quality category (Boen et al., 2012; Burns et al., 2007; Dozeman et al., 2011; Dozeman et al., 2012; Haight et al., 1998; Joling et al., 2011; Joling et al., 2012; Robinson et al., 2008; Romeo et al., 2011; Rovner et al., 2007; Rovner et al., 2014; Rybarczyk et al., 2001; van Schaik et al., 2014) and one demonstrated excellent quality (Konnert et al., 2009).

A number of interventions which demonstrated good methodological quality were not found to be efficacious in reducing the incidence of late life depression, or depressive symptoms. For example, selective interventions targeting older people at risk of depression due to social isolation did not find evidence for the efficacy of a senior centre social programme (Boen et al., 2012). Counselling based interventions also failed to find significant results. For example, individual and family based counselling for dementia caregivers was not superior to usual care (Joling et al., 2012). Further, when investigating the economic aspects of their intervention, Joling and colleagues did not find any evidence for the cost effectiveness of counselling in comparison to treatment as usual control.

Stepped care interventions with a significant psychological treatment also demonstrated mixed results in the selective prevention of late life depression. Dozeman and colleagues (2012) evaluated an intervention involving watchful waiting, self help, life review therapy, and a consultation with a GP and found that the risk of major depression was significantly reduced in the intervention group vs treatment as usual control (adjusted risk ratio = 74%). However, in a very similar study of stepped care including a life review component, there was no significant difference between intervention and control at 24 month follow up (van Schaik and colleagues, 2013).

However, life review therapy in isolation was also evaluated by studies investigating selective prevention in late life depression. For example, a six-week life review course resulted in a significant

decrease in depressive symptoms at post intervention and 12 month follow up (p=0.05) (Haight et al., 1998). In a follow up study, the authors reported that the intervention resulted in a continued year by year improvement in depressive symptoms (t=-2.20; p<0.03; Haight et al., 2000). However, by follow up the study suffered large attrition effects, and results are based on a small sample and as such should be interpreted with caution.

Problem solving therapy group interventions were found to reduce the incidence of late life depression at the end of the intervention in comparison to a placebo control. However, as there was no treatment as usual control group in this instance, results can only be considered to be preliminary and should be interpreted with caution (Robinson et al., 2008). A further problem solving therapy intervention consisting of six individual sessions delivered over eight weeks was found to significantly reduce the incidence of depressive disorders in individuals with age related macular degeneration in comparison to treatment as usual control (Rovner et al., 2007). However, significant effects had diminished by six month follow up (Rovner & Casten, 2008).

One of the most frequently reported selective interventions were CBT based groups and individual therapies, however mixed results were demonstrated across studies. Burns and colleagues (2007) offered up to seven sessions of individual CBT delivered by individuals with a bachelor's degree in psychology, under the supervision of a doctoral qualified clinical psychologist, but failed to find a significant treatment effect. In an almost identical study, Romeo and colleagues (2011) did not find a significant treatment effect in a six session individual CBT intervention delivered by an assistant psychologist. A CBT based guided self help intervention was not found to reduce the incidence of depression in comparison to treatment as usual control (Dozeman et al., 2011). Similarly, CBT based bibliotherapy was not found to be significant in reducing depression symptoms at post intervention in comparison to treatment as usual control (Joling et al., 2011). However, demonstrating positive results, a 13 week CBT based 'coping with depression' group intervention was found to improve depressive symptoms at three, and six month follow up in comparison to treatment as usual control (Konnert et al., 2009). This may be due to the fact that the intervention was considerably longer than those offered by Burns and colleagues (2007) and Romeo et al. (2011), or that the intervention was delivered in a group setting on this occasion.

CBT based health promotion group interventions were not found to be effective in reducing depressive symptoms. For example, a mind and body wellness course based on CBT did not result in a significant difference in depression symptoms at post intervention or twelve month follow up in

comparison to controls (Rybarczyk et al., 2001). Further, a sixteen month health advocacy and counselling programme only found a significant difference in depressive symptoms in male participants (Salminen et al., 2005).

Anxiety

One study was given a total quality rating falling within the 'poor' category (Bourgault-Fagnou & Hadjustavropoulos, 2013) and as such will be excluded from the narrative findings of this review. Three studies received a rating of 'good' (Dozeman et al., 2011; Dozeman et al., 2012; Joling et al., 2012; and one was found to have 'excellent' methodological quality, (van't Veer-Tazelaar et al., 2009).

Indicated Prevention

Three studies looked at indicated prevention interventions for late life anxiety. Two studies addressed stepped care interventions including psychological components, as well as a watchful waiting, self help, and primary care consultation elements. Dozeman and colleagues (2012) did not find support for their intervention in reducing the incidence of anxiety. However, van't Veer-Tazelaar et al. (2009) demonstrated that their intervention halved the 12 month incidence of anxiety disorders. In a follow up study they found that their intervention was statistically more cost effective in comparison to treatment as usual, and later demonstrated that effects were sustained at 24 months. These studies differed only in the main psychological treatment intervention, Dozeman and colleagues investigating life review therapy, and van't Veer-Tazelaar and colleagues evaluating problem solving therapy, therefore this may suggest that problem solving therapy is more effective. However, van't Veer-Tazelaar and colleagues did not separate out the incidence of depression and anxiety after their intervention and as such, these findings may be explained by effects of the intervention on depression, not anxiety.

Selective Prevention

In the only study of selective prevention for late life anxiety, Joling and colleagues (2012) did not find any empirical support for their counselling intervention consisting of individual, and family counselling for dementia caregivers. In a follow up study there was also no evidence of differences in cost between the intervention and treatment as usual control (Joling et al., 2013).

Table 4 – Quality of Included Studies

Author	Design	Sampling Method	Population	Controls	Intervention Validity	Treatment Fidelity	Measures	Tool	Attrition	Power	Statistics	Follow up	Overall Quality Rating
DEPRESSION (Indicated Prevention)													
Bosemans et al. (2014). Netherlands	Well covered (3)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Well covered (3)	Well covered (3)	Adequate (2)	Well covered (3)	28 Good
Haight et al. (1992). USA	Adequate (2)	Poor (1)	Adequate (2)	Adequate (2)	Poor (1)	Poor (1)	Adequate (2)	Poor (1)	Poor (1)	Poor (1)	Poor (1)	Well Covered (3)	18 Poor
Mastel-Smith et al. (2007) USA	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Well Covered (3)	Poor (1)	Poor (1)	Poor (1)	Poor (1)	Poor (1)	Poor (1)	Not Addressed (0)	16 Poor
Reynolds et al. (2014). USA	Well Covered (3)	Adequate (2)	Well Covered (3)	Poor (1)	Adequate (2)	Adequate (2)	Adequate (2)	Well Covered (3)	Well Covered (3)	Well Covered (3)	Poor (1)	Well Covered (3)	28 Good
Scogin et al. (1989). USA	Adequate (2)	Poor (1)	Well Covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Adequate (2)	Poor (1)	Adequate (2)	Poor (1)	Poor (1)	Adequate (2)	20 Poor
Stahl et al. (2014). USA	Adequate (2)	Adequate (2)	Poor (1)	Poor (1)	Adequate (2)	Poor (1)	Adequate (2)	Well Covered (3)	Poor (1)	Well Covered (3)	Poor (1)	Well Covered (3)	23 Good
Van der Weele et al. (2012). Netherlands	Well covered (3)	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Poor (1)	Well Covered (3)	Poor (1)	Adequate (2)	Well Covered (3)	Adequate (2)	Well Covered (3)	27 Good

v'ant Veer-Tazelaar et al. (2009). (2010) (2011) Netherlands	Well covered (3)	Well covered (3)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Well covered (3)	Well covered (3)	Adequate (2)	Well covered (3)	30 Excellent
Wahl et al. (2006). Germany	Adequate (2)	Adequate (2)	Well covered (3)	Adequate (2)	Poor (1)	Not Addressed (0)	Well Covered (3)	Poor (1)	Poor (1)	Poor (1)	Poor (1)	Not addressed (0)	17 Poor
Walker et al. (2010). Australia	Well covered (3)	Adequate (2)	Well covered (3)	Poor (1)	Poor (1)	Not Addressed (0)	Adequate (2)	Not Addressed (0)	Well Covered (3)	Well Covered (3)	Poor (1)	Not addressed (0)	19 Poor
Author	**Design**	**Sampling Method**	**Population**	**Controls**	**Intervention Validity**	**Treatment Fidelity**	**Measures**	**Tool**	**Attrition**	**Power**	**Statistics**	**Follow up**	**Overall Quality Rating**
DEPRESSION (Selective Prevention)													
Birk et al. (2004). Germany	Poor (1)	Adequate (2)	Poor (1)	Poor (1)	Adequate (2)	Poor (1)	Well Covered (3)	Poor (1)	Adequate (2)	Poor (1)	Adequate (2)	Not Addressed (0)	17 Poor
Boen et al. (2012). Norway	Well covered (3)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Adequate (2)	Poor (1)	Adequate (2)	Well Covered (3)	Adequate (2)	Well covered (3)	26 Good
Burns et al. (2007) England	Well covered (3)	Adequate (2)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Well covered (3)	Poor (1)	Well Covered (3)	Well Covered (3)	Adequate (2)	Adequate (2)	28 Good
Dozeman et al. (2011). Netherlands	Well covered (3)	Adequate (2)	Well covered (3)	Well covered (3)	Adequate (2)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Not addressed (0)	27 Good

Dozeman et al. (2012). Netherlands	Well covered (3)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Well covered (3)	Adequate (2)	Well Covered (3)	Well Covered (3)	Poor (1)	Adequate (2)	27 Good
Haight et al. (1998). (2000) USA	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Poor (1)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Poor (1)	Well Covered (3)	25 Good
Joling et al. (2011). Netherlands	Well Covered (3)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Poor (1)	Well Covered (3)	Poor (1)	Adequate (2)	25 Good
Joling et al. (2012). (2013) Netherlands	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Adequate (2)	Adequate (2)	Well Covered (3)	Well Covered (3)	Well Covered (3)	Well Covered (3)	29 Good
Konnert et al. (2009). Canada	Well covered (3)	Well Covered (3)	Well Covered (3)	Adequate (2)	Adequate (2)	Well Covered (3)	Well Covered (3)	Well Covered (3)	Well Covered (3)	Poor (1)	Adequate (2)	Adequate (2)	30 Excellent
Mossey et al. (1996). USA	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Poor (1)	Not Addressed (0)	Well Covered (3)	Adequate (2)	Poor (1)	Adequate (2)	Poor (1)	Well Covered (3)	21 Poor
Phillips et al. (2000). USA	Adequate (2)	Adequate (2)	Well Covered (3)	Poor (1)	Poor (1)	Not Addressed (0)	Adequate (2)	Poor (1)	Poor (1)	Well Covered (3)	Poor (1)	Not Addressed (0)	17 Poor
Robinson et al. (2008) USA	Well Covered (3)	Adequate (2)	Well Covered (3)	Poor (1)	Adequate (2)	Adequate (2)	Adequate (2)	Well Covered (3)	Well Covered (3)	Well Covered (3)	Adequate (2)	Not Addressed (0)	26 Good
Romeo et al. (2011). England	Well covered (3)	Adequate (2)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Well covered (3)	Poor (1)	Well Covered (3)	Well Covered (3)	Adequate (2)	Adequate (2)	28 Good
Rovner et al. (2007)	Well covered	Well covered	Well covered	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Poor (1)	Well covered	Well covered	Poor (1)	Adequate (2)	27 Good

Rovner & Casten (2008). USA	(3)	(3)	(3)						(3)	(3)			
Rovner et al. (2014) USA	Well Covered (3)	Adequate (2)	Well Covered (3)	Well Covered (3)	Adequate (2)	Well Covered (3)	Adequate (2)	Poor (1)	Adequate (2)	Well Covered (3)	Adequate (2)	Adequate (2)	29 Good
Rybarczyk et al. (2001). USA	Adequate (2)	Well Covered (3)	Well Covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Adequate (2)	Poor (1)	Adequate (2)	Well Covered (3)	Poor (1)	Well Covered (3)	25 Good
Saito et al. (2012). Japan	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Poor (1)	Poor (1)	Adequate (2)	Poor (1)	Adequate (2)	Poor (1)	Poor (1)	Adequate (2)	20 Poor
Salminen et al. (2005). Finland	Adequate (2)	Well Covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Not Addressed (0)	Adequate (2)	Poor (1)	Adequate (2)	Well Covered (3)	Poor (1)	Not Addressed (0)	19 Poor
Van Schaik et al. (2014). Netherlands	Well covered (3)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Poor (1)	Adequate (2)	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Well covered (3)	26 Good
Anxiety Studies													
Author	**Design**	**Sampling Method**	**Population**	**Controls**	**Intervention Validity**	**Treatment Fidelity**	**Measures**	**Tool**	**Attrition**	**Power**	**Statistics**	**Follow up**	**Overall Quality Rating**
ANXIETY (Indicated Prevention)													
Bourgault-Fagnou & Hadjistavropoulos.	Adequate (2)	Poor (1)	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Poor (1)	Poor (1)	Adequate (2)	Not Addressed (0)	19

(2013) Canada													
Dozeman et al. (2011). Netherlands	Well covered (3)	Adequate (2)	Well covered (3)	Well covered (3)	Adequate (2)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Not addressed (0)	27
Dozeman et al. (2012). Netherlands	Well covered (3)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Well covered (3)	Adequate (2)	Well Covered (3)	Well Covered (3)	Poor (1)	Adequate (2)	27
v'ant Veer-Tazelaar et al. (2009). (2010) (2011) Netherlands	Well covered (3)	Well covered (3)	Adequate (2)	Well covered (3)	Adequate (2)	Adequate (2)	Adequate (2)	Adequate (2)	Well covered (3)	Well covered (3)	Adequate (2)	Well covered (3)	Excellent
Author	**Design**	**Sampling Method**	**Population**	**Controls**	**Intervention Validity**	**Treatment Fidelity**	**Measures**	**Tool**	**Attrition**	**Power**	**Statistics**	**Follow up**	**Overall Quality Rating**
ANXIETY (Selective Prevention)													
Joling et al. (2012) (2013) Netherlands	Adequate (2)	Adequate (2)	Well Covered (3)	Adequate (2)	Adequate (2)	Poor (1)	Adequate (2)	Adequate (2)	Well Covered (3)	Well Covered (3)	Well Covered (3)	Well Covered (3)	29

DISCUSSION

This systematic review integrates and appraises the evidence for the use of primary prevention interventions in the context of common mental health problems in later life. In general, the findings from this review demonstrate mixed findings for the use of selective and indicated prevention interventions in comparison to treatment as usual controls. However, the evidence for the use of preventive interventions in the context of late life anxiety is severely limited, and it is not possible to make any conclusions, however tentative, regarding the efficacy of these approaches.
Research, largely generated by groups in the Netherlands and United States, has identified that both selective and indicated prevention interventions may offer potential new strategies in efforts to reduce the burden of late life depression. These studies suggest that it is possible to target individuals known to be at increased risk of depression, based on physical markers, sociodemographic factors, or the presence of subclinical symptoms. While results have varied across studies, research has offered preliminary evidence regarding the use of preventive interventions in diverse samples of older people, in varied settings, and with a broad range of psychologically rooted interventions.

Indicated prevention interventions for late life depression demonstrated mixed results. Stepped care interventions for older people with subthreshold symptoms of depression were found to be effective in significantly reducing depression incidence and depressive symptoms in comparison to treatment as usual control in all studies employing this treatment approach (Boseman et al., 2012; van der Weele et al., 2012; v'ant Veer-Tazelaar et al., 2009). Results were found to be maintained for up to 24 months (van't Veer-Tazelaar et al., 2011). Further, as each of these studies employed a different psychological intervention component e.g. life review therapy (Bosemans et al., 2012), CBT based 'coping with depression' course (van der Weele et al., 2012), and problem solving therapy (van't Veer-Tazelaar et al., 2009). This suggests that it may not be the actual form of psychological therapy intervention within the stepped care protocol which is important, rather the overall treatment intervention. Reasons for this may include the length of intervention if participants stepped through all stages of the intervention, or the regular contact with health professionals for those who did not. An alternative explanation is that participants benefitted from the social contact and group dynamic involved in the intervention. Each of these interventions also included a self help step prior to the psychological intervention. In each case the self help intervention was also based in psychological theory and therefore, it may have been this, rather than the effect of the third

psychological therapy step in the intervention which resulted in treatment effects. However, the incidence of depressive disorders was reported together with that of anxiety disorders in one case (van't Veer-Tazelaar et al., 2009) and while on one hand this limits the ability to quantify the intervention effect on each disorder, the high comorbidity of anxiety and depression in later life preserves some utility in these findings. Future research should investigate this by looking at the relative explanatory power of each step of the intervention and should consider outcomes in more detail.

Further, two out of these three studies also conducted an economic evaluation of their stepped care intervention (Bosemans et al., 2012; van't Veer-Tazelaar et al., 2010). Boseman and colleagues demonstrated that a stepped care intervention had similar costs to treatment as usual, and v'ant Veer-Tazelaar and colleagues demonstrated a significant cost effect where the stepped care intervention was found to be more cost effective than treatment as usual. Therefore, while it may be premature to conclude that stepped care interventions are a cheaper option to usual care, they do appear to offer a cost effective alternative where individuals can experience an improvement in symptoms for no more than the cost of a less efficacious treatment option. However, these results can only be interpreted as preliminary, and only applicable to an intervention modelled on that of the authors. Jane-Llopis et al (2005) also highlight the need for more cost effectiveness research. Policy makers and society need to be convinced of this, so more precise cost-benefit models need to be developed and more cost effectiveness research undertaken to provide arguments that governments need in making spending decisions on prevention.

A short course of problem solving therapy (Reynolds et al., 2014) and coaching in healthy lifestyle practices (Stahl et al., 2014) provided preliminary evidence for the efficacy of preventive interventions in older people with subthreshold depression symptoms. Interestingly, both of these interventions were relatively long in duration and both were based in a group setting. Therefore, future investigations would benefit from further analysis regarding the active treatment components of interventions.

Studies investigating selective prevention interventions in the context of late life depression demonstrated mixed findings. A number of selective studies were excluded on the basis of poor methodological quality. However of those demonstrating good quality, those targeting older people at risk of depression due to social isolation (Boen et al., 2012) and those offering individual and family based counselling to caregivers of dementia (Joling et al., 2012) did not find significant

treatment effects. Further, cost effectiveness of counselling interventions was also non significant (Joling et al., 2013).

In contrast to stepped care interventions in an indicated prevention context, those evaluated as selective prevention interventions demonstrated mixed results (Dozeman et al., 2012; van Schaik et al., 2013). Both studies investigated the use of life review therapy as the major psychological component in the intervention and the similarity of interventions in general makes it difficult to explain the reason for this discrepancy. However, life review therapy in isolation was found to reduce depression symptoms (Haight et al., 1998), with findings sustained at three year follow up (Haight et al., 2000). While this length of follow up is extremely promising, further research with larger sample sizes should endeavour to confirm these findings.

Problem solving therapy and cognitive behavioural therapy are two of the most well evidenced therapies in the treatment of late life depression at clinical levels (Francis & Kumar, 2013). In a preventive context, preliminary evidence was found for PST in older people following a significant health event (Robinson et al., 2008; Rovner et al., 2007). However, future research should endeavour to extend the follow up period of studies, and ensure an adequate control comparison is in place. CBT interventions however demonstrated much more ambigious findings. No evidence was found to support the use of individualised CBT (Burns et al., 2007; Romeo et al., 2011), nor CBT based self help interventions (Dozeman et al., 2011; Joling et al., 2011). However, a longer term CBT group based intervention was found to improve depression symptoms at three and six month follow up in comparison to treatment as usual control (Konnert et al., 2009).

There may be a number of explanations for these findings. First of all the length of intervention may be important. Both individual CBT interventions offered only 6 or 7 sessions, which is half of that offered by Konnert and colleagues. On the other hand, the difference may be in the mode of delivery of the intervention. In studies by Burns and colleagues, and Romeo and colleagues, CBT was delivered by an assistant psychologist who may be considered to be relatively unskilled in comparison to a fully trained CBT therapist or clinical psychologist. Further, as a number of studies in this review performed poorly on methodological assessment of treatment fidelity, it may be that the intervention delivered was not manualised CBT, and thus may not have been as effective. Alternatively, the group based format of Konnert and colleagues' intervention may have contributed to the treatment effect in their study. Therefore, future research should aim to improve treatment

fidelity, and explore treatment mechanisms in relation to outcomes in order to further understand the forces driving these discrepancies in findings.

There was no support for selective prevention of late life anxiety as the one study exploring this area did not find empirical support for their counselling intervention with dementia caregivers (Joling et al., 2012). In terms of indicated prevention, two stepped care studies were inconsistent in their findings, therefore it is impossible to speculate the extent of the success of anxiety prevention and thus findings are not generalizable at this stage. It is no surprise that there is extremely limited evidence of efficacy for the prevention of late life anxiety disorders as this area of research is in its infancy in comparison to that for depression with approximately four times the amount of studies being published in this area. This is an area of priority for future research.

Implications for Clinical Practice

While the findings of the current review support the feasibility and efficacy of some forms of selective and indicated prevention for late life depression, the reality of implementing these approaches in the context of modern health care systems is unlikely to be straightforward. The current healthcare system does not encompass a prevention arm, with services primarily focussing on the treatment of existing mental health problems. Further, many older people are unlikely to come into contact with secondary care services, preferring instead the services of general practice (Arean, Hegel, & Reynolds, 2001). This suggests that the current method of service delivery must change in order to be able to fully utilise any potential benefits from preventive interventions for late life mental health problems.

~~Further, the~~The current service delivery model does not reflect the concern of many stakeholders within the mental health sector, who place prevention and health promotion high on the agenda of priorities (Christensen et al., 2013). Government policy, and target drivers have tended to focus on the effective and efficient treatment of existing mental health problems. However, additional support for prevention is needed at government level in order to filter down to individual health services. Health care organisations share a common problem of volume of delivery of psychological interventions, and many publicly funded health systems content with the problem of long waiting times for treatment. National and local initiatives to reduce waiting times by increasing access could significantly benefit from developing preventative interventions, given the evidence reviewed here.

There are a number of potential barriers to the implementation of primary prevention interventions into routine clinical practice in NHS Scotland. In order for preventive interventions to work well, individuals with subclinical symptoms, or the presence of known risk factors, must be identified as being at elevated risk. This may well be problematic in practice as research shows that older people are less likely to be referred to a specialist mental health service and are more likely to discuss subclinical symptoms in primary care. However, studies have shown that General Practitioners lack awareness regarding the key risk factors for late life depression and anxiety. In order to rectify this, tools for the assessment of risk indicators are required. This would initially require the development and evaluation of potential screening measures, followed by training in their across primary care services and beyond. Effective programmes build capacity though adequate resources and comprehensive professional development for programme providers. Results of a meta-analysis on mental health promotion and disorder prevention interventions found that high quality implementation including training and supervision of programme providers predicted higher programme efficacy (Jane-Llopis, 2002).

However, there is also significant potential for the delivery of preventive interventions beyond the health care setting. Research exploring the implementation of preventive interventions in community settings, via the media and computerised programmes, and in the commercial sector should be explored. It would seem poignant to consider exploring the addition of psychological intervention elements to existing community based or social groups, for example preparation for retirement courses, gentle exercise classes etc. This may help to explore means of improve accessibility and acceptability in groups of community dwelling older people, as well as those residing in permanent care settings. A limitation of the current evidence base for prevention is that most trials are from western cultures, and there is also a lack of real world situations. Barry & McQueen (2005) highlight the need to identify mental health promotion initiatives that are effective, feasible, low cost and sustainable across diverse cultural contexts and settings. Therefore, future research should focus on the potential to evaluate the use of preventive interventions beyond western healthcare systems.

Future Research

There is a need for more efficacy trials which demonstrate outcomes over longer durations of study, and with larger numbers of participants in order to ensure that preventive interventions are indeed actively preventing depression and anxiety, as opposed to merely delaying it in older people. A substantial number of studies were excluded from the results of this paper due to poor

methodological rigour as measured by quality criteria specifically developed for the purposes of this review. To address this, longer term efficacy trials in wider populations of older people known to be at increased risk of common mental health problems are needed to establish the broader clinical utility of preventive interventions. Further, future research should design studies in a way which allows for comparison of treatment components. For example comparing the active components in group based vs individual interventions, perhaps by measuring regularly during trials and phasing delivery of components.

With specific regard to anxiety, significant work is required to establish the psychological prevention of late life anxiety as a feasible and efficacious management approach in order to build support from stakeholders and increase the likelihood of strong enough evidence to influence clinical practice. In an already stretched health service, it may be that practical limitations prevent these interventions being trialled in clinical practice as such, and alternative models of delivery should be explored in order for this to be feasible on a larger scale. Further, the significant comorbidity of anxiety and depression in later life suggests that any study exploring a preventive intervention in this context should collect data on both anxiety and depression outcomes in order for further information to be gained regarding which intervention works for whom.

Almeida (2014) highlights the need to 'understand the pathways that lead to the onset, persistence and recurrence of depressive symptoms' as 'a crucial first step on the road to developing effective preventative measures'. However, while this is improving, there continues to be an inadequate evidence base regarding whether specific preventive interventions are likely to be successful among people with specific risk factors. Further research in this area is a priority for the effective and efficient prevention of common mental health problems in later life. This highlights the need to consider the context of cost effectiveness, as there is currently an inadequate evidence base regarding whether specific preventive interventions are likely to be successful among people with specific risk factors. Future research should consider how best to match interventions to individuals so that there is less of a burden in terms of repeated interventions after failed attempts. For example, there may be selective preventive interventions which may be particularly suitable for individuals with macular degeneration which may not work well with carers of individuals with dementia. More research utilizing preventive interventions in specific at risk groups would help to determine which intervention is most suitable for whom.

Prevention has been shown to be a very cost effective alternative to the treatment of common mental health problems in older people, and in other age groups (Vos et al., 2010). However, research to date has not established whether there are long term sustainable effects from interventions to prevent mental disorders across the lifespan. Thus it is prudent for future research to endeavour to extend follow up periods in order to provide some evidence for sustainable effects of primary preventive interventions. Further, in order for sustainability to be truly demonstrated, embedding effective preventive intervention components within the health care system and social care system is required to understand long term impact. However, this is a major challenge and requires additional research, as well as solutions and policy changes from governments and health care organisations.

As highlighted above, cost effectiveness and practicality issues may warrant research exploring alternative modes of delivery of preventive interventions. Considering how to adapt interventions to reach the largest number of individuals possible may be a worthy area of research. For example, technological advances may mean that preventive interventions can be delivered via computerized programming or via the internet.

Limitations of the Current Study

The results of this review are limited by the fact that only published studies were included. Publication bias is a common limitation in systematic review (Parekh-Bhurke et al., 2011). However, the current review did include many good quality papers that reported non significant findings. Another limitation is that the inclusion and exclusion criteria, which attempted to reduce heterogeneity and increase the ability to compare papers, may have excluded some potentially informative studies.

The heterogeneity of studies and study participants means that synthesising and interpreting findings is difficult. Further, as the study only had one rater, despite rigorous methodology in terms of assessing and interpreting individual studies, a certain level of subjectivity in unavoidable in this case. An additional weakness of the current review is that authors of included studies were not contacted directly and so the review may have missed any unpublished data held by authors which might have been relevant to this review.

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Chapter Two: Empirical Research Journal Article

Psychological Flexibility in an Ageing Population: Exploring the impact of age on psychological flexibility, the use of selection, optimisation and compensation strategies, and their relationship with psychopathology.

Journal of Contextual Behavioural Science.

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This work is presented as required for submission to the Journal of Contextual Behavioural Science. Instructions for Authors are included in Appendix I. Referencing Style and Guidelines are included in Appendix II.

Abstract

Background:

Current treatments for late life depression and anxiety have been dominated by a cognitive behavioural approach. While treatment of depression studies have demonstrated similar efficacy to studies in younger people, studies investigating late life anxiety have not demonstrated such convincing findings. In addition, there are a range of gerontological issues specific to an older adult population which should be considered in the treatment of their mental well being. For example, may older people experience chronic physical health problems and pain related conditions. An alternative form of CBT approach comes from Acceptance and Commitment Therapy, and studies have already begun to investigate its effects on psychopathology in older people. However, there has been little exploration of this model in an older adult population, and thus this study endeavours to investigate the relationships between constructs of the psychological flexibility model that underpins ACT, and indices of psychopathology in older people.

Method:

A questionnaire comprised of standardised measures was employed to assess the relationships between various psychological variables in community based older people i.e. a non clinical population. A cross sectional sample of older people aged 55 to 98 was included in the study. Correlation and multiple regression analysis including conditional process modelling was used to analyse the relationships between variables.

Results:

187 individuals between the age of 55 and 98 from across Scotland participated in the study. A range of theoretically predicted correlations support the potential of the ACT model in older people. Initial analyses also suggest overlap between psychological flexibility and socioemotional selectivity theory. Interestingly age was not significantly associated with any of the theoretical constructs in this study. However, the perception of health, as opposed to objective experience of chronic illness and disability was associated with psychopathology. Further, findings suggest that cognitive fusion is a moderator in the relationship between perception of good health and psychopathology, including depression, anxiety and stress. Significant positive relationships were also demonstrated between perception of positive health and use of coping strategies associated with successful ageing (SOC), and between the use of SOC strategies and engagement in values based living.

Discussion:

Findings from this study suggest that interventions targeting cognitive fusion, engagement in valued living (such as ACT), and the use of SOC strategies may be an effective treatment in late life depression and anxiety. There may also be a role for this type of intervention to be adapted for individuals experiencing conditions which increase stress, and in turn increase their risk of developing a major depression or anxiety disorder. In this regard, the findings of this study support the further theorising of how to conceptualise change and adaptation in older people as part of a contextual behavioural science approach in the hope that this could offer avenues to explore practical guidance for targeting the influential relationships described in this data.

Word Count: 400

Key Words: Depression, anxiety, ACT, SOC, Older People, Later Life

Introduction

Demographic Change

The world is currently experiencing a significant demographic shift towards an increasingly ageing population, which is profound and irreversible (WHO., 2010; UNFPA., 2012). This trend is thought to be a result of increased birth rates and a reduction in mortality due to improved health and social care (WHO, 2010). Approximately one in six people in the United Kingdom are currently aged 65 and over, however this is predicted to rise to one in four by the year 2035 (Office for National Statistics., 2012). Further, it is the 'oldest old' population (aged 85 and over) which is projected to expand most rapidly, with numbers expected to double by 2030 (Laidlaw & Pachana., 2009). As well as affecting individuals, communities and wider society, this shift will bring challenges of both structural and economic nature which will undoubtedly place increasing demand on health and social care systems (UN., 2009; WHO., 2010). Previous estimates suggest that demographic change is responsible for adding £1 billion per year to National Health Service costs across the UK (The Kings Fund Estimate., 2011). Scotland is at the forefront of this phenomenon observed throughout the developing world and it's unique context of social, health and lifestyle factors must be considered to understand the consequences of ageing locally. The significance of these issues has been reflected in a series of strategic policies and papers produced by the Scottish Government (e.g. Scottish Executive., 2007) in which the health and wellbeing of older people is highlighted as a priority. Thus, research addressing effective health care models for older people is crucial in promoting health, preventing disease, and managing chronic illness in an ageing population (WHO, 2008). This has been further reflected in a House of Lords report, which stated that the United Kingdom is currently underprepared for the demographic change and that societal attitudes to ageing must change (HL Paper 140, UK, 2013).

Common Mental Health Problems in Older People

Common mental health problems such as depression and anxiety frequently affect older people, however methodological differences in the definition of age cut-offs and diagnostic criteria has led to significant variation in prevalence rates. While it is acknowledged that depression is common in later life (Luppa et al., 2012), estimated prevalence rates of major depressive disorder have varied between 1% (De la Camara, Saz, Lopez-Anton, et al., 2008) and 5.37% (Park, Lee, Lee, et al., 2010) in community based studies. Similarly, a growing body of literature supports the notion that while prevalence rates of anxiety disorders decline somewhat with age, they are common in later life

(Nordhus & Pallensen, 2003; Thorp et al., 2009) affecting between 3.2 and 14.2% of older people (Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010). Further, certain subpopulations are thought to be at increased risk of depression and anxiety disorders in later life, e.g. individuals in medical and care settings (Jorm, 2000; Rodda, Walker, & Carter., 2011; Yohannes et al., 2000). In addition, mixed or comorbid depression and anxiety are thought to be more common than pure depression or pure anxiety in older people (Byers et al., 2010; Prina et al., 2011).

However, major depression and anxiety disorders only captures a small proportion of psychopathology in older people. Subthreshold symptoms are consistently reported to be equally, if not more, common with epidemiological studies suggesting that between 4 and 15% experience subclinical depression (Alexopolous, 2005; Beekman, Deeg & Geerlings, 2001). Further, incidence of subclinical depressive disorders in later life is thought to increase with advancing age, and is particularly prevalent in individuals aged 80 and over (Blazer, 2003; Lavretsky & Kumar, 2003; VanItallie et al., 2005). Subclinical anxiety is also thought to be common in later life, and it has been suggested that these should be considered as clinically significant (e.g. Judd & Akiskal, 2002; Lavretsky & Kumar, 2002). In a similar way to major disorders, certain subpopulations of older people are at increased risk of subclinical presentations of depression and anxiety across medical and long term care settings (e.g. Meeks, Vahia, Lavretsky, Kulkarni, & Jeste, 2011; anxiety).

Consequences of Depression and Anxiety in Later Life

The negative consequences of untreated depression and anxiety in late life are far reaching and affect individuals as well as health care providers and wider society. Both are likely to follow a chronic and unremitting course and untreated have a significant impact on the quality of life of older people (Blazer, 2003; 2010; Brenes et al., 2005; Chapman & Perry., 2008; Nirenberg et al., 2010; Porensky et al., 2009). With regard to depression, subclinical presentations have an increased short and long term risk of developing major depressive disorders (Beekman et al., 2002; Cuijpers et al., 2007; Lyness et al., 2006; Andreescu et al., 2008). Further, both diagnosable disorders and subthreshold symptoms are known to increase healthcare expenditure through increased utilisation and associated costs (Chapman & Perry., 2008; Meeks, Vahia, Lavretsky, Kulkarni, & Jeste., 2011; Snowden et al., 2008). In addition, both are associated with a number of adverse outcomes including and lead to a number of adverse outcomes including risk of cognitive impairment (Boyle et al., 2010; Dotson, Resnick, & Zonderman, 2008; Han et al., 2008); physical ailments (Bremmer et al., 2006; Rafanelli et al., 2006) and worsening of comorbid medical illnesses (Carnethon et al., 2007),

greater functional impairment (Brenes et al., 2005; Hybels et al., 2009) and increased risk of requiring residential care (Gibbons et al., 2002); and suicidal ideation (Wiktorsson et al., 2010).

Similarly, there is little evidence to discriminate between the effects experienced by those meeting the full criteria of an anxiety disorder and those with subthreshold symptoms (Grenier, Preville, Boyer, O'Connor, Beland, Potvin, et al., 2011). Anxiety in older people is known to result in reduced quality of life and increased disability rates (Porensky et al., 2009), as well as increased depression and other comorbidities (Gallagher-Thompson, Steffen, Thompson, et al., 2007). Even older people suffering from minor anxiety are psychiatrically and medically less healthy, and have been shown to use health care services more frequently, in comparison to those without anxiety (Grenier et al., 2011). The need to treat late life anxiety is increasingly recognised, and acknowledged by the emergence of several meta analyses and review articles (Pinquart & Duberstein, 2007; Hendriks, Oude Voshaar, Keijsers, Hoogduin, & van Balkom, 2008; Thorp, Ayers, Nuevo, Stoddard, Sorrell, & Wetherell, 2009; Gould, Coulson, & Howard, 2012).

Current Treatments for Common Mental Health Problems in Later Life

Psychological interventions and pharmacological treatments have been shown to be effective for depression in later life (Anderson, 2004; Alexopoloous, 2005; Cuijpers, Straten, van Oppen, & Andersson, 2008; Keir, Quigley, Thomson, McLachlan, & Gillanders, *unpublished*; Laidlaw et al., 2008; Wilson, Mottram, & Vassilas, 2008). However, treatment of late life depression to date has relied heavily on pharmacological approaches (Rodda et al., 2011). As many antidepressant medications have been shown to be safe and well tolerated in older people (Mamdani et al., 2000; Sonnenberg et al., 2008) international guidelines now support the use of selective serotonin reuptake inhibitors (SSRIs) as a first line treatment for older people with depression and their younger counterparts alike (Lam et al., 2009; NICE, 2009). However, this has been disputed with some studies demonstrating minimal benefit in comparison to placebo control in older adults (Kok, Nolen & Heeren., 2012; Mukai & Tampi, 2009; Nelson et al., 2008; Sneed et al., 2008; Further, problems with polypharmacy are also well documented in the older adult population (Kaufman, 2011), thus it is crucial to examine the role of alternative treatment approaches such as psychotherapy in the management of late life depression.

The number of studies of psychological treatments of depression in later life has increased considerably in recent years. Generally research to date suggests that treatment efficacy of psychotherapy interventions for depression in later life is similar to that in younger people

(Cuijpers, van Straten, & Smit, 2006; Pinquart, Duberstein, & Lyness, 2007; Wilson, Mottram & Vassilas, 2008; Cuijpers, van Straten, Smit & Andersson, 2009). In a recent meta-analysis involving 44 studies, Cuijpers and colleagues (2014) demonstrated a large effect size between psychotherapy and control groups g=0.64 (95% CI: 0.47-0.80) which corresponded to a number needed to treat value of three. Cognitive behavioural therapy (g=0.45; 95% CI: 0.29-0.60), life review therapy (g=0.59; 95% CI: 0.36-0.82), and problem solving therapy (g=0.46; 95% CI: 0.18-0.74) were found to be effective in comparison to control groups (Cuijpers et al., 2014).

Among the psychotherapies, Cognitive Behavioural Therapy (CBT) has dominated the evidence base to date (Pinquart, Duberstein & Lyness, 2007). CBT is focused on the links between an individual's thoughts, feelings and behaviour. It has been suggested that CBT is a particularly suitable intervention for older people as it is easy to understand, has a problem focus, and aims to enhance skills, which empowers people and encourages the development of independent coping strategies (Laidlaw, Thompson, & Gallagher-Thompson, 2004). Adaptions to enhance outcomes with older people have recently been specified (Cuijpers et al., 2010; Laidlaw et al., 2003). To date, several systematic reviews and meta analyses have examined the role of CBT for late life depression and concluded that it is more effective than usual treatment, and equally effective in comparison to other psychotherapy approaches and to pharmacotherapy interventions (e.g. Gould, Coulson, & Howard, 2012). There is also increasing evidence regarding the positive impact of psychological interventions on the physical health outcomes of older people. This is of particular importance in the context of long term conditions, which are known to be particularly prevalent in this population. However, findings are somewhat limited due to overestimation of treatment effects as a result of publication bias and heterogeneity in the severity of depression symptoms experienced, with many studies including data from individuals experiencing subthreshold symptoms.

In comparison to late life depression, research regarding pharmacological treatment of anxiety in this population is sparse, and many guidelines are based on extrapolation from research with working age adults as opposed to specific randomised controlled trials involving older adults. Current evidence suggests that pharmacological treatments appear to have slightly greater effects than psychotherapy in older people (Goncalves & Byrne, 2012; Schuurmans et al., 2009). However, Benzodiazepine medications are frequently overprescribed to older people with anxiety, and while they are effective in the short term (Goncalves & Bryne, 2012) they should not be used as a first line treatment due to significant side effects including cognitive impairment, withdrawal symptoms,

incontinence, and falls which can lead to hip fractures and fall related death (Pariente et al., 2008; van der Hooft et al., 2008).

Large meta-analyses and other research trials suggest that late life anxiety disorder can be effectively treated with both serotonergic antidepressants and CBT (Pinquart & Duberstein, 2007; Hendriks, Oude Voshaar, Keijsers, Hoogduin, & van Balkom, 2008; Thorp, Ayers, Nuevo, Stoddard, Sorrell, & Wetherell, 2009; Gould, Coulson, & Howard, 2012). These conclusions are tentative due to the lack of well-designed RCTs in older age groups. Most studies are small, and encounter similar problems to those looking at depression in later life. Often the average age of patients in many available trials is 70 and under due to the inclusion of subjects aged 55 and over (Pinquart & Duberstein, 2007).

Thus, while CBT has consistently demonstrated efficacy for older people experiencing depressive disorders (e.g. Serfaty et al., 2009), evidence for its efficacy with late life anxiety is mixed (Hendriks, Oude Voshaar, Keijsers, Hoogduin, & van Balkom, 2008; Pinquart & Duberstein, 2007; Schuurmans, et al.,. 2006; Stanley et al., 2009; Thorp et al., 2009; Wetherell et al., 2009; Wolitzky-Taylor, Castriotta, Lenze, Stanley & Craske, 2010). For example, a recent study by Wetherell et al (2013) comparing younger and older patients with anxiety disorders suggests that late life anxiety disorder is more treatment resistant compared with that in younger patients. This further highlights the need for data that demonstrates the efficacy and effectiveness of alternative psychotherapy interventions for common mental health problems in later life. It also argues for the development of age specific strategies in later life such as addressing some of the uncontrollable aspects of ageing that contribute to the risk of developing a common mental health problem. Third wave CBT may be promising, such as mindfulness based stress reduction (Gillanders & Laidlaw, 2014; Wetherell, Afari, Ayers, Stoddard, Ruberg, Sorrell, et al., 2011) and Acceptance and Commitment Therapy. Acceptance and Commitment Therapy (ACT – said as one word) is a third wave cognitive behavioural therapy that has developed alongside of a behaviour analytic account of language and cognition, called Relational Frame Theory (RFT: Hayes, Barnes-Holmes & Roche, 2001).

Problems with the Current System

Despite the significant consequences of depression and anxiety in later life, both continue to be under recognised, and therefore under treated (Chew-Graham et al., 2012, p.52; Bryant, 2010; Jeste et al., 2005; van Hout et al., 2004). Despite significant empirical research regarding interventions for common mental health problems in later life, older people are generally under-represented in

mental health care settings (Laidlaw et al., 2008; McBee, 2008), with many receiving no treatment, or inadequate care (Ciechanowski, Wagner, Schmaling, et al., 2004; Grenier et al., 2011; Lin, Katon, Von Kroff, et al., 2003; Unutzer, Simon, Belin, Datt, Katon, Patrick, 2000). Research demonstrates that older people are less likely to receive psychological support than their younger counterparts (Unutzer et al., 2003). In fact, the Royal College of Psychiatrists report that 80% of older people with depression do not receive any treatment at all (RCP, 2009), and similar figures have been demonstrated in a population of older people with anxiety disorders (Grenier et al., 2011).

As well as under recognition and under treatment of common mental health problems in later life, treatments with negative side effects are also common. Of those older people who do report symptoms to their GP, the majority will not be offered treatment in line with best practice guidelines (Crystal, Sambamoorthi, Walkup, & Akincigil, 2003; Wang et al., 2005), and will typically be prescribed a pharmacological intervention, where under-treatment as a result of sub-therapeutic dosing is also common (Karlin, Duffy, & Gleaves, 2008). In late life anxiety disorders, benzodiazepine use is common, and it is thought that between 25 and 43% of this population use these drugs (e.g. Grenier et al., 2011), with the majority never having had a trail of evidence based treatments like CBT or serotonergic antidepressants. These trends in the treatment of late life depression and anxiety disorders exists despite evidence suggesting that older people may prefer psychotherapeutic treatment approaches (Gum, Iser, & Petkus, 2010; Mohlman., 2012), and evidence demonstrating the risk of polypharmacy and adverse side effects in ageing individuals (Lunde et al., 2009).

Alternative Treatment Approaches

An Acceptance Based Approach

Previous research has highlighted the potential utility of third wave cognitive behavioural therapies in treating common mental health problems in later life. For many older people, the experience of advancing age can be burdensome. This population are increasingly subject to painful conditions, diminishing mobility, loss of strength and endurance, sensory difficulties, insomnia, and cognitive decline. Socially, later life can be a time of loneliness, loss, bereavement and a loss of independence. Developments in mindfulness and acceptance based approaches have prompted interest in developing these approaches as alternatives to traditional CBT as a result of the specific characteristics of common mental health problems in older people (Lingberg, 2005; McBee, 2008; McHugh, Simpson, & Reed, 2010; Rejeski, 2008).

Taking a distinctly different perspective from traditional cognitive therapy, ACT may be ideally suited to the particular needs of older people. In the ACT model, six overlapping and interdependent processes lead to psychological inflexibility, which is thought to be a key factor in psychopathology. These six processes include willingness, defusion, contact with the present moment, clarity of values, committed actions, and a flexible repertoire of perspective taking skills, which is termed 'self as context'. ACT has developed in the context of consistent empirical evidence supporting the notion that humans tend to avoid unpleasant thoughts, feelings, and bodily sensations, and that this 'experiential avoidance' can contribute to a range of psychological problems (Hayes et al., 2006). ACT combines mindfulness, acceptance and behavioural change strategies (Hayes, Strosahl, & Wilson, 2012) to reduce avoidance by fostering acceptance, and commitment to valued actions, which has been shown to be effective in living well with a wide range of psychological difficulties and chronic health problems. Based on these theoretical underpinnings, ACT has been promoted as a potentially useful alternative in treating geriatric populations who commonly experience loss, reduced control, and other life changes that commonly contribute to psychological problems in older people (Petkus & Wetherell, 2013).

The evidence base for ACT is developing rapidly across a wide range of physical and mental health conditions in a range of populations (e.g. Ruiz, 2010) and is only in the early stages of evidence for its application in ageing (for a review see Gillanders and Laidlaw, 2014; Keir et al., *unpublished*). The processes associated with psychopathology in ACT are postulated to persist into later life. For example, the suppression of unwanted thoughts has been shown to reduce the subjective sense of meaning in life (Krause, 2007), and is also associated with poorer outcomes following treatment for depression across the lifespan (Rosenthal, Cheavens, Compton, Thorp, and Lynch, 2005). Behavioural avoidance has been associated with increased depression (Andrew & Dulin, 2007) and persistent anxiety (Ayers et al, 2010) in older people in a similar way to younger adults. Thus, the presence of markers of psychological inflexibility, the primary measure of psychopathology in the ACT model, has been shown to have particularly negative implications for functioning in older people and therefore supports the rationale for the potential efficacy of ACT in this population.

The specific characteristics of mood and anxiety disorders in later life have also been highlighted in the context of offering theoretical support to applying ACT with this population. Anxiety and depression are known to be highly comorbid and difficult to distinguish in this population (Gum & Cheavens, 2008). ACT is a transdiagnostic model: the same six processes are applied across a wide range of problems with minimal disorder specific adaptation, potentially making treatment of late

life mental health disorders more efficient. If it is not necessary to distinguish between disorders, utility with older individuals with comorbidities may also be possible in a more cost effective group format. In addition, ACT may offer a more acceptable, less stigmatising alternative as a result of the focus being on the more tangible goal of living life in accordance with deeply held values. This hypothesis is supported by prospective research in which attrition rates from a clinical trial treating GAD were lower among older people treated with ACT when compared with those treated with CBT (Wetherell et al., 2011).

Although features associated with ageing suggest the particular applicability of ACT to this population (Alonso-Fernandez et al., 2013; Lunde & Nordhus, 2009; Petkus & Wetherell, 2013), only two further published empirical investigations to date have examined the efficacy of ACT in older adults. Karlin & colleagues (2013) compared outcomes from treatment with ACT in a group of 76 older and 655 younger veterans with depression and found substantial and equivalent improvement in depression and quality of life in both groups. McCracken and Jones (2012) reported that a group of 40 older adults undergoing an ACT based 3-4 week inpatient interdisciplinary chronic pain treatment program showed improvements in pain severity, physical and psychological disability, depression, anxiety, pain acceptance, and values based action both immediately following the intervention and at 3 month follow up. However, neither of these involved a randomised controlled trial.

Wetherell and colleagues (2015) added to the evidence base which suggests that ACT may be particularly suitable for older people. They conducted secondary analysis of a previous study (Wetherell et al., 2011) in which 114 adults aged 18 to 89 were randomly assigned to 8 weeks of group based CBT or ACT interventions for chronic pain. Findings suggested that older people were more likely to respond to ACT both immediately following treatment and at 6 month follow up. Attrition data suggested that ACT was an acceptable treatment for older people, and although the sample size was small, the study adds weight to the preliminary evidence (Lunde & Nordhus, 2009; Alonso-Fernandez et al., 2013) supporting ACT as an alternative psychological intervention for older people with chronic pain.

Consideration of Lifespan Development and Theories of Successful Ageing

The Ageing Paradox

Theoretical support for the use of ACT with older people comes from research on emotion regulation and coping skills where a paradox of well being in later life has been highlighted. It is

thought that the losses and challenges associated with ageing do not affect the emotional state of older people as might be expected (Mroczek & Kolarz, 1988). This is supported by the fact that, despite older people experiencing an increase in risk factors known to contribute to depression and anxiety, evidence suggests that there is a lower frequency of depression in later life in comparison to younger adulthood or middle age (Sadavoy, 2009). Research has suggested three protective factors including better emotional regulation skills, increased wisdom, and resilience may explain this paradoxical finding (Blazer, 2010). It is thought that older people are more resilient with regard to loss than their younger counterparts. Older people may see loss as to be expected in later life, and research demonstrates that their recovery from bereavement is greater in older than younger people (Blazer, 2010). Further, older adults report high levels of life satisfaction and are generally thought to have better emotion regulation strategies (Blanchard-Fields, Mienaltowski & Seay, 2007) which may contribute to better stability in emotional wellbeing (Carstensen et al., 2011).

In this thread, socio-emotional selectivity theory (Carstensen et al., 1999) proposes that as people age, their priorities and motivations change and greater emphasis tends to be placed on goals relating to ensuring current emotional stability. For example, it is thought that older people are more likely to invest in existing social relationship as opposed to goals relating to the future, such as initiating new relationships and building new social networks. The result of these proposed changes to priorities and motivations in later life is thought to be improved emotional well being and emotional stability with age (Carstensen et al., 2011). This is a direct contrast to the commonly held belief that older people are not able to benefit from psychotherapy approaches due to them being more rigid or 'set in their ways'. Conversely, if older people are more adept at emotion regulation, they may be more or equally able to benefit from psychotherapy than younger people.

The concept of wisdom has been explored as another factor which may help to explain this ageing paradox. Wisdom is thought to increase with age (Laidlaw, 2010; 2013) which is thought to help people to better manage stressful life events and thus may protect against depression. In particular it is thought that older people are more adept at anticipating potentially stressful life events which allows them to minimise the risk of negative emotions associated with them (Scheibe & Carstensen, 2010).

While encouraging as potential explanations to the so called paradox of ageing, there is little offered in the way of explaining how the aforementioned factors are developed, or whether they may in fact be part of a larger scale change in psychological functioning in later life. It may be that the extent to

which older people are psychologically flexible can partially explain the improvements in emotion regulation observed in older people. Thus, an ACT based approach may be able to draw on the strengths of older people in the context of a need to cultivate efficacious coping skills and stress reduction techniques for those who have not employed these independently.

Lifespan Development, Selection, Optimisation and Compensation Theory and an ACT Approach

Central to the concept of positive ageing, is the continuation of skill acquisition and learning throughout the lifespan. Life span development theory provides a framework of themes for understanding human development from conception to old age where a developmental continuum exists. Changes associated with stage of development prompt a shift in the balance of allocation of resources from resilience (growth, maintenance and recovery) to more regulation, or management of loss. (Staudinger, Marsike, & Baltes, 1995). In childhood and early adulthood the primary allocation of resources is directed towards growth whereas in old age, more resources are directed towards the management of loss as few resources remain available to be allocated to growth. 'Psychological plasticity', or the ability to learn or employ strategies to compensate for the characteristic shift from gains to losses in ageing is thought to be central to well being in later life (Baltes, 1995). Baltes & Baltes (1990, p.2) coined the term 'adaptive capacity' to describe this psychological reserve in which older people can employ latent psychological resources to preserve their well being in the context of ageing. This work is of significant interest in terms of adapting to challenges associated with ageing, but is also relevant in the context of developing interventions for treatment and prevention of late life mental illness.

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Baltes & Baltes (1990) argue that there are two groups of factors, which contribute to positive ageing: those which are in the control of the older person, and those which are not. From this work, the authors described a behavioural typology thought to be associated with the ability to access reserve capacity in later life, and they proposed the theory of Selection, Optimisation with Compensation (SOC). In this model, individuals experiencing declines associated with ageing may limit their goals to those that are most highly valued (selection), work harder to strive toward achieving those goals (optimisation), and employ alternative strategies to compensate for formerly used strategies that may no longer be workable (compensation). Fully acknowledging the changes and challenges experienced with increasing age, this model suggests that self efficacy and mental well being can improve when older individuals recognise and accept the limits imposed by the ageing process, and in doing so, employ SOC strategies which lead to a reduced, but transformed life.

The application of SOC strategies has been associated with greater adaption to the challenges of ageing (Gignac, Cott, & Badley, 2002), and disengaging from inappropriate commitments or goals

and replacing them with more feasible goals has been associated with better emotional well-being (Wrosch, Dunne, Scheier, & Schulz, 2006; Wrosch, Sheier, Miller, Schulz, & Carver, 2003). Further, previous literature suggests that older people who actively expend resources on problems or losses of functioning which they are unable to change, for example loss of mobility, are more likely to experience depression (Isaacowitz & Seligman, 2002). Previous research has highlighted the plasticity in older peoples' behaviour and possible psychological reserve in response to one of the most common losses associated with ageing, the experience of physical disability. compensation was the most commonly used strategy employed to buffer against disability associated with osteoarthritis, this was followed by selection, and lastly optimisation.

Wetherell et al. (2015) argue that ACT is highly consistent with the Selective Optimisation with Compensation (SOC) model of successful ageing (Baltes & Freund, 1999). In fact, previous research has investigated the use of a combination ACT/SOC approach in the treatment of chronic pain in later life. Alonso-Fernandez and colleagues (2015) demonstrated that an ACT treatment with additional training in the use of SOC strategies was successful in significantly improving acceptance, pain related anxiety, the use of compensation strategies, and a reduction in catastrophizing beliefs and depressive symptoms. Their results provide further support for the overlap between ACT and SOC and suggest that an integrated approach can help older people with pain to improve their emotional wellbeing and functional capability.

However, key to understanding life span development and how individuals cope with age related losses (e.g. applying SOC strategies) is cultural context. Human development occurs within a cultural context, thus a culture-inclusive lifespan development view is important as aspects such as the socio-economic system, religion, the family system, and so forth will impact upon an individual's availability of resources and their allocation of them. In considering the application of this theoretical perspective in Scotland, it is essential to consider the unique aspects of health, housing, employment and lifestyle and their impact on an individual's ability to manage age related losses, and direct remaining resources towards growth, whether this be through a SOC type framework or otherwise. Health is improving in Scotland and those below the age of fifty have been raised in a more health conscious society. However, Scotland continues to experience significant inequalities around health and quality of life between the poor and the more affluent. Unfortunately social exclusion is a feature of several urban and rural areas of Scotland, which has been found to be particularly noticeable among older people (Falkingham, 2002). Thus, the interpretation of theories of successful ageing is unlikely to be straightforward and consideration of factors related to socio-economic status, education, and deprivation is vital. The extent of losses experienced by individuals in deprived areas, and their means to implement strategies such as selection, optimisation and compensation in a bid for successful ageing are likely to be limited as a result of deprivation and social exclusion and a general lack of resources to draw upon.

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Rationale for the Current Study

The literature suggests that there is a significant overlap between ACT, socio-emotional selectivity theory and SOC theories, however, the way these perspectives relate to mental health problems in older people warrants further investigation. Although researchers have pointed to the potential utility of applying ACT in an older adult population, the applicability of the ACT processes across the lifespan remains an assumption without empirical verification. Prior to any further empirical investigation regarding the efficacy of ACT in older populations, it seems pertinent to explore the relationships between ACT variables and other related psychological factors across the age range of older people. For example, this work may highlight discrepancies between older vs younger older people. In further studies of ACT in later life it is important that age itself can be ruled out as a factor in the dynamic between psychological inflexibility, coping mechanisms and symptoms of psychopathology in older people. However, to date the appropriateness of ACT for older adults is based in gerontological theory in which theories of adult development and ageing seem to provide a strong rationale for this. Research to date has almost exclusively been conducted with older people who do not have mental health symptomatology. Thus, as highlighted by Petkus & Wetherell (2013) "more research is needed to examine the association between ACT related processes and psychopathology in older adulthood". Further, research to date with older people has tended to focus on the overarching construct of psychological flexibility and not on the six overlapping and interdependent processes that contribute to psychological flexibility. It is worth considering these concepts in greater detail when looking to implement or adapt this approach for a new population. Of particular interest is whether psychological flexibility changes as we age, if the oldest old differ from the youngest old in terms of psychological flexibility and its constituent processes and if so, whether this is related to greater use of SOC strategies. Clarity in this area would allow for the development of preventive interventions to target these factors in order to improve well-being in late life and prevent first episode depression in this age group.

Aims and Objectives

The current study seeks to explore the relationship between ACT related processes and ageing. It also aims to explore the relationship between ACT processes, positive ageing through the use of coping mechanisms in line with Selection, Optimisation and Compensation (SOC) theory, and the experience of symptoms of common mental health problems in later life.

The present study had a number of hypotheses:

1. In line with socioemotional selectivity theory which posits that age is associated with better emotion regulation Psychological flexibility will increase with age, which will also manifest as reduced cognitive fusion, reduced experiential avoidance, and increased commitment to valued living with age.
2. In line with biased appraisal theories, such as cognitive therapy, it will be the perception of health, rather than the actual experience of chronic conditions in ageing that will be predictive of psychological problems.

3. This relationship will be moderated by cognitive fusion in that high levels of cognitive fusion will exacerbate the level of psychological difficulty.
4. Negative health perception will lead to less adaptive use of SOC and that poor use of SOC will lead to lower engaged living, which will further mediate the impact of health perception on psychopathology.
5. These direct and indirect paths will be moderated by cognitive fusion.

Method

Study Design

The present study was designed to test the hypothesis that older people with lower levels of psychological flexibility, and higher levels of cognitive fusion, will be more likely to experience symptoms of psychopathology.

This project intended to collect data from a sample of older people who are representative of the wider community dwelling older adult community i.e. those without significant cognitive or physical impairment which requires residential care. Individuals over the age of 55 were sought to participate in the study in order to represent individuals who are pre-retirement (not yet classed as an 'older adult'), as well as 'younger old adults' (65-74), 'older old adults' (75-84) and the 'oldest old' (85+). It was envisaged that this would offer greater understanding of the processes of change in relation to age.

The recruitment of participants into the study was conducted in two stages. Stage one involved the primary researcher making links with voluntary services and community based groups for older people across Scotland. Following ethical approval for the study, questionnaires were distributed to a cross sectional sample of community dwelling older people across various regions of Scotland.

Inclusion and exclusion criteria

The study maintained broad inclusion and exclusion criteria. Participants were included in the study if they were; aged 55 years and older, maintained their own tenancy or lived in a complex with minimal support, and provided their informed consent. Participants were excluded from the study if they experienced significant cognitive or sensory impairment that would hinder their participation, for example blindness. Individuals who required full time care in a nursing or care home were not included in recruitment procedures for this study. Responses were also excluded if they were returned with more than 20% of the data missing.

Recruitment

Participant recruitment took place over an eight week period between June and August, 2015. The recruitment strategy deliberately sought to obtain as broad and representative a sample of

community dwelling older people as possible. Recruitment was conducted in sheltered housing complexes, social centres, community participation groups, lunch clubs, and day services.

Participants were recruited from the Scottish Borders, Fife, Forth Valley, Highland, and Greater Glasgow areas, thus including both rural and urban settings.

Organisations working with older people were contacted and given a brief explanation of the study rationale and what participation would involve and this was followed by a request to distribute the questionnaires. All of the organisations agreed to participate.

Questionnaire Distribution

Distribution of study measures was dependent on the organisation participants were recruited from. The majority of older people were approached via age related organisations. Organisations were approached initially to gain consent to approach service users. In most instances, initial consent was provided at an organisational level, and the researcher than arranged to visit groups of service users to explain the purpose of the study and to invite them to participate. In these circumstances, study packs were left with staff members from the organisation to allow potential participants to consider participating without perceived pressure from the researcher. Organisations visited included Age Scotland branches across Scotland, Scottish Borders Council and City of Edinburgh gentle exercise classes for older people, individual social groups and clubs for older people.

Study Measures

Demographic information

Demographic information was collected including the following factors: age; gender; marital status; education status; socio economic status; employment status; living arrangements; experience of chronic physical health conditions; the experience of previous psychological difficulties.

The Depression, Anxiety and Stress Scale, Short Form (DASS 21; Antony, Bieling, Cox, Enns, & Swinson, 1998).

This 21-item questionnaire consists of three 7-item self-report scales taken from the full version of the DASS. It is designed to measure the severity of symptoms common to both depression and anxiety, and thus could be particularly suited to older people where comorbidity of these disorders is common. In completing the DASS, the individual is required to indicate the presence of a symptom over the past week according to a scale scored from 0 (did not apply over the last week) to 3 (applied to me much, or most of the time over the last week) (e.g. "I found it hard to wind down" – stress; "I experienced trembling in my hands" – anxiety; "I felt down-hearted and blue" – depression). Its reliability and validity has been established with Cronbach's Alpha for the total scale (α =.94) and each individual scale in an older adult sample (depression α = .87; anxiety α = .69; stress α = .89; Henry & Crawford, 2005). It has been shown to have a factor structure consistent with younger samples, good discriminant validity, and excellent convergent validity demonstrated via moderate to strong predicted correlations with the Beck Anxiety Inventory and Beck Depression Inventory II (range .47 - .76) people (Gloster, Rhoades, Novy, Klotsche, Senior, Kunik, Wilson & Stanley, 2008). The Cronbach's alpha for the current study was .96

The Acceptance and Action Questionnaire II (AAQ-II – Bond, Hayes, Baer, Carpenter, Guenole Orcutt, Waltz, & Zettle, 2011).

This seven item self-report measure of psychological inflexibility was developed in response to problems with the original (AAQ-I) scale, and has demonstrated better psychometric consistency. It provides a measure of the overarching construct of psychological flexibility which is comprised of specific constructs including cognitive fusion, experiential avoidance, and engagement in values based living. Participants are asked to rate on a 7-point Likert-type scale the degree to which each statement is true for them (e.g. "I am afraid of my feelings"). Higher scores indicate higher levels of psychological flexibility. In the original validation study Cronbach's alpha demonstrated reliability and validity of the measure with a mean alpha coefficient of .84 (95% CI .78 - .88) and three and twelve month test-retest reliability of .81 and .79 respectively (Bond et al., 2011). It was found to be moderately negatively correlated with measures of depression and anxiety e.g the Hospital Anxiety and Depression Scale-A and the Centre for Epidemiological Studies-Depression scale (range .31 - .40) (Fledderus, Oude Voshaar, ten Klooster, & Bohlmeijer, 2012). The Cronbach's alpha for the current study was .83.

The Brief Experiential Avoidance Questionnaire (BEAQ; Gamez, Chmielewski, Kotov, Ruggero, Suzuki & Watson, 2014)

This 15 item self-report scale was developed from the 62 item Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gamez, Chmielewski, Ruggero, Kotov, & Watson, 2011) and is designed to tap into content from each of the MEAQ's six core dimensions of behavioural avoidance, distress aversion, procrastination, distraction/suppression, repression/denial, and distress endurance. Items are rated on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree) (e.g. "I feel disconnected to my emotions", "I work hard to keep out upsetting feelings"). Cronbach's alpha values suggest good validity and reliability (mean α = .86) and strong convergence with each of the six dimensions of the MEAQ is also demonstrated (range r = .39 to .80). In addition, the BEAQ has demonstrated correlations with associated measures of avoidance, psychopathology and quality of life (range = .33 to .73). It was also found to be distinguishable from negative affectivity and neuroticism. The Cronbach's alpha for the current study was .86.

The Cognitive Fusion Questionnaire (CFQ, Gillanders et al., 2014)

The CFQ is a seven item self-report questionnaire which provides a general measure of cognitive fusion, one of the six processes of the psychological inflexibility model and a key treatment target in ACT. The CFQ is generic to thinking as opposed to specific thought content. Items explore literality, engagement, entanglement, and struggle with thoughts, and behaviour dominated by thinking (e.g. "I tend to get very entangled with my thoughts"). Higher scores indicate greater levels of fusion. Validation studies have demonstrated that the CFQ is reliable, with a mean alpha of .91. The CFQ has also demonstrated concurrent validity via correlations with associated measures of mindfulness, rumination, thought control strategies, distress, well being and quality of life (Gillanders et al., 2014). Cronbach's alpha for the current study was .93.

The Engaged Living Scale (ELS - Trompetter, ten Klooster, Schreurs, Fledderus, Westerhof, & Bohlmeijer, 2013)

The ELS is a 16-item self-report process measure of an engaged living response style as conceptualised in the Acceptance and Commitment Therapy model. Two subscales, Valued Living and Life Fulfilment, give a total score in which high scores demonstrate greater engagement in

values based living. Respondents are asked to indicate the degree to which they completely agree (1) or completely disagree (5) on a 5-point Likert-type scale (e.g. "I know how I want to live my life"). The ELS was found to demonstrate moderate to strong correlations with the Cronbach's alpha values for full scale (.91) and subscales (valued living = .89; life fulfilment = .87) demonstrate good validity and reliability. Construct validity is demonstrated via moderate to strong correlations with theoretically related process and outcome variables e.g. AAQ-II (.51), physical (.22) and mental health (.49). The alpha value for the current study is .94.

Selection, Optimisation and Compensation Questionnaire (SOC - Freund & Baltes, 2002)

Based on the theoretical perspective of Baltes & Baltes (1990) the SOC questionnaire is a measure of the frequency with which participants use elective selection, loss based selection, optimisation, and compensation (SOC) as strategies of life management. Selection is primarily focused on goal setting and due to the causal and functional origins of such, there are two kinds of selection described in the model. Elective Selection (ES) has a focus on attaining desired states. Loss Based Selection (LBS) however, entails reorganising one's goal system as a result of a loss in a specific goal domain. This can include the development of new goals, or prioritisation of the most important ones (Freund & Baltes, 2002).

There are 12 items to each subscale, with each item consisting of two statements (response options), one of which denotes a response consistent with SOC strategies, and the other donating a behavioural response not related to SOC (e.g. "I make important life decisions" SOC vs "I don't like to commit myself to specific life decisions" non-SOC). Participants must choose the option that best reflects his or her way of adapting to life changes. Higher scores on the measure indicate greater/more frequent use of SOC strategies. The validity and reliability of each subscale has been demonstrated using Cronbach's alpha values ranging from .67 to .78 (Baltes et al., 1999). Later analysis demonstrated high test-retest stability over a four week period (r = .71 to .76; Freund & Baltes, 2002). Correlation analysis has also demonstrated meaningful convergent and divergent associations with other psychological constructs, e.g. thinking styles. The Cronbach's alpha value for this study was .91.

The EuroQOL 5D Scale (EQ-D5: The EuroQol Group, 1990)

The EQD5 is a commonly used quality of life measure that combines participant response to questions about five quality of life domains. These dimensions include mobility, self care, usual activities, pain/discomfort, and anxiety/depression. Participants must respond to each dimension by indicating whether they were frequently, occasionally, or never a problem in their daily lives. Higher scores represent higher disruption to quality of life. The EQD5 has demonstrated excellent psychometric properties (alpha = .67) and is recommended when a succinct assessment of health related quality of life is required (Haywood, Garratt & Fitzpatrick, 2005). The Cronbach's alpha value for this study was .78.

Power Calculation

Findings from a previous study in this area suggests that it is reasonable to predict a medium effect size as this study will employ similar measures in a similar population e.g. community based older people (Keir et al., 2014). Power calculations were conducted using the tables recommended by Cohen (1992) and reflect the following statistical analysis plan:

Hypothesis 1 - In line with socioemotional selectivity theory which posits that age is associated with better emotion regulation, Psychological flexibility will increase with age, which will also manifest as reduced cognitive fusion, reduced experiential avoidance, and increased commitment to valued living with age. For correlational analysis to detect a medium effect (r= 0.3 or larger) at an alpha of 0.05 and a beta of 0.80, the sample size required is 85 participants (Cohen, 1992).

Hypothesis 2 - Perception of good health will be negatively correlated with psychological problems. For correlational analysis to detect a medium effect (r= 0.3 or larger) at an alpha of 0.05 and a beta of 0.80, the sample size required is 85 participants (Cohen, 1992).

Hypothesis 3 – The relationship between perception of health and psychopathology will be moderated by cognitive fusion in that high levels of cognitive fusion will exacerbate the level of psychological difficulty. For moderation analysis to explore the relationship between cognitive flexibility, perception of health and psychopathology (DASS 21 score), to detect to detect a small effect (r= 0.15 or larger for a model with main effects and interaction) at an alpha of 0.15 and a beta of 0.80, the sample size required is it 135 (Aitken & West, 1991, table 8.2).

Hypothesis 4 - Negative health perception will lead to less adaptive use of SOC and that poor use of SOC will lead to lower engaged living. For moderation analysis to explore the relationship between cognitive fusion, perception of health, and psychopathology (DASS 21 score), to detect to detect a small effect (r= 0.15 or larger for a model with main effects and interaction) at an alpha of 0.15 and a beta of 0.80, the sample size required is it 135 (Aitken & West, 1991, table 8.2).

Hypothesis 5 – The direct and indirect paths described in (2), (3) and (4) paths will be moderated by cognitive fusion. For moderation analysis to explore the relationship between cognitive fusion, perception of health, and psychopathology (DASS 21 score), to detect to detect a small effect (r= 0.15 or larger for a model with main effects and interaction) at an alpha of 0.15 and a beta of 0.80, the sample size required is it 135 (Aitken & West, 1991, table 8.2).

Ethical Approval

Ethical approval was sought and granted through the University of Edinburgh ethics system (appendix III). The research was conducted according to the ethical principles of the British Psychological Society (BPS) code of conduct for research with human subjects, including confidentiality, informed consent, right to withdraw, and steps taken to minimise distress (The British Psychological Society, 2009).

Questionnaire Packs

Questionnaire packs were produced and contained all of the relevant information relating to the study including: information sheet; consent form; questionnaire pack; and participant debrief form. The packs also included a pre-paid envelope with the study correspondence address and a pen to increase ease of completion. To allow an accurate response rate calculation, a record was kept regarding the number of questionnaire packs distributed to each group to allow recall of questionnaires which had not been distributed.

Pilot Study

The questionnaire packs were piloted with a group of 5 participants for readability as this was felt to be particularly important in an older adult population.

Results

The researcher distributed 850 questionnaire packs to organisations and groups across Scotland. 205 people responded which indicates a response rate of 24.1%. Of the responses, a total of two responses were excluded due to not meeting the inclusion criteria for age, and 16 had missing data which was greater than 20% of all study measures and were therefore excluded. This resulted in a total sample size of 187 participants. After excluding 18 participants as described above, no case had more than 5% missing values. Unfortunately the recruitment method did not allow for comparison in characteristics between responders and non-responders.

Preliminary analysis confirmed that there were no violations of the assumptions of linearity, homoscedasticity, or multicollinearity and all variables were normally distributed aside from psychopathology, as measured by the DASS-21. As depression, anxiety and stress were found to have a positively skewed distribution, logarithmic transformations were conducted to improve the normality of the data. However, while this improved the distribution of the data, it did not succeed in meeting the assumption of normality. In this case, the decision regarding the use of non-parametric tests was considered. However, it is of greater importance that the residuals are normally distributed rather than the actual raw data.

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All analyses were conducted using SPSS (version 21). Planned analyses included descriptive data, correlational analyses, and four forced entry, multiple regression analyses testing the prediction of depression, anxiety, stress, and quality of life by all of the predictor variables that were shown to correlate with the dependent variable. A simultaneous forced entry method was chosen as it offers a measure of the individual predictive capacity of each variable, whilst controlling for the presence of other variables in the equation, which is a useful model to apply in building and comparing the importance of constructs (Field, 2003, p.321).

However, linear regression cannot test for interaction, mediation and moderation effects between variables. Therefore, conditional process analysis (Hayes, 2013) was used to allow the exploration of a theory driven model in which it is the subjective perception of health, not the actual experience of health conditions in later life, which is predictive of psychopathology in terms of depression, anxiety and stress. It also allowed for the exploration of indirect influences on these relationships, for example the use of coping mechanisms associated with successful ageing (SOC) and engagement in valued living as mediators between perception of health and psychopathology. It was also hypothesised that the impact of these direct, and indirect routes would be moderated by cognitive fusion, as Gillanders et al. (2014) highlighted that fusion is a more appropriate predictor of thought based appraisals than is overall psychological flexibility. The model was tested using the syntax supplied by Hayes (2014).

Sample Characteristics

Of the 187 participants included in this study, 62.6% were female, 98.3% were white, and the majority were within the 55-64 age bracket (58.8%). There were far fewer individuals in the 'oldest' older adult group aged 85 and over (2.7%). 37.5% of the sample had at least one chronic physical health condition, with 13.4% reporting multiple morbidity. The majority of the sample had not previously (88.2%) nor were they currently (75.9%) receiving treatment for a mental health problem of any kind. 75 (40%) of participants were educated to bachelors degree level or above. A summary of the key demographic characteristics of the sample included in this study are outlined in Table 1, below. Descriptive statistics for predictor and outcome variables with normative data for comparison are outlined in Table 2.

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Table 1

Participant Characteristics (n=187)

Characteristic		n	%
Gender	Male	69	36.9
	Female	117	62.6
Age	55-64	110	58.8
	65-74	50	26.7
	75-84	22	11.8
	85+	5	2.7
Marital Status	Married/Cohabiting	131	70.1
	Widowed/Divorced/Single	56	29.9

Highest Level of Education	GCSE/O Level or less	31	16.6
	A Level	20	10.7
	College Education/Diploma/Vocational Training	53	28.3
	Bachelor's or Associate Degree	30	16.0
	Professional Degree	26	13.9
	Master's Degree	12	6.4
	Doctor's Degree	7	3.7
	Missing	8	4.3
Ethnicity	White	98	98.3
	Other	0	0
	Missing	2	1.7
Chronic Conditions	Nil	117	62.6
	One	45	24.1
	More than one	25	13.4
Previous Care for Mental Health	Nil	165	88.2
	Community Mental Health Team	1	0.5
	General Practitioner	10	5.3
	Private Mental Health Practitioner	0	0
	Other	0	0
	Missing	11	5.9
Current Care for Mental Health	Nil	142	75.9
	Community Mental Health Team	10	5.3
	General Practitioner	19	10.2
	Private Mental Health Practitioner	3	1.6
	Other	4	2.1
	Missing	9	4.8

Prevalence of Distress

18.7% of the sample (n=35) was experiencing clinical levels of depression, 17.1% of anxiety (n=32) and 18.7% were experiencing stress (n=35) above the clinical cut of range. Scores ranged between 1 and 35 for depression, 1 and 33 for anxiety, and 1 and 40 for stress. Mean scores were 5.9, 4.7, and 8.3 respectively (see Table 3)

Table 2

Descriptive statistics for predictor and outcome variables with normative data for comparison.

Variable	Possible range	Min	Max	Mean	SD	Normative data	
						Mean	SD
Psychological flexibility (AAQ-II)	0-70	10	60	25.3	9.00618	30.7	9.9
Cognitive fusion questionnaire (CFQ)	7-49	7	43	16.5	7.45046	21.22	10.36
Engaged Living Scale (ELS)	0-80	16	75	60.9	10.3	60.8	7.8
Brief Experiential Avoidance Questionnaire (BEAQ)	0-90	19	83	44.2	12.8	43.3	12.5
Selection, Compensation and Optimisation Questionnaire (SOC) ELECTIVE SELECTION	0-12	1	12	4.7	3.3	5.7	3.0
Selection, Compensation and Optimisation Questionnaire (SOC) LOSS BASED SELECTION	0-12	0	12	7.3	3.5	9.0	2.5
Selection, Compensation and Optimisation Questionnaire (SOC) OPTIMISATION	0-12	0	12	8.1	3.4	8.6	2.4
Selection, Compensation and Optimisation Questionnaire (SOC) COMPENSATION	0-12	0	12	7.5	3.4	8.6	2.3
Depression, Anxiety, and Stress Scale – 21 item version (DASS-21) DEPRESSION (comparison from Sinclair et al., 2012)	0-42	1	34	5.8	7.9	5.7	8.2
Depression, Anxiety, and Stress Scale – 21 item version (DASS-21) ANXIETY (comparison from Sinclair et al., 2012)	0-42	1	31	4.7	6.5	4.0	6.3
Depression, Anxiety, and Stress Scale – 21 item version (DASS-21) STRESS (comparison from Sinclair et al., 2012)	0-42	1	41	8.3	8.0	8.1	7.6
Quality of Life (EQ5D)	0-10	0	7	0.98	1.15		
Perception of Health (EQ5D) (Comparison from Allsup & Gosney, 2002 –older people)	0-100	10	100	81.9	16.0	84.5	14.4

In the majority of variables, the current sample was found to have similar mean scores on measures with similar standard deviations. This suggests that the non clinical community based sample in this study was not qualitatively different to the normative data provide on the majority of study measure. However, it is worth noting that the current sample was found to be less cognitively fused, and less psychologically inflexible than normative data samples. In each case, this difference equates to approximately a five-point difference on the CFQ and AAQ.

Table 3

Prevalence of Distress

	Depression			Anxiety			Stress		
Descriptor	***Range***	***n***	***%***	***Range***	***n***	***%***	***Range***	***n***	***%***
Normal	0-9	152	81.3	0-7	155	82.9	0-14	152	81.3
Mild	10-13	16	8.6	8-9	6	3.2	15-18	15	8.0
Moderate	14-20	6	3.2	10-14	9	4.8	19-25	11	5.9
Severe	21-27	5	2.7	15-19	6	3.2	26-33	6	3.2
Extremely Severe	28+	8	4.3	20+	11	5.9	34+	3	1.6

From table three above, the majority of participants in the current study were not suffering from clinical levels of depression, anxiety or stress. However, 18.8% of participants were experiencing mild symptoms of depression or greater, with 10.2% falling within a likely clinical depression range. This is consistent with cited prevalence rates in community dwelling older people (Blazer, 2003). A similar number of individuals in the study were experiencing mild symptoms of anxiety or greater (17.1%). However, a greater proportion of the sample reported symptoms of anxiety consistent with a clinical disorder (13.9%) which is also in keeping with prevalence rates in older people (Bryant et al., 2008). Stress was the most common form of distress with 18.9% of the sample experiencing mild stress to extreme stress.

Correlation Analyses

Table 4 demonstrates a pattern of 13 correlations in predicted directions, consistent with previous research and theory.

Table 4

Correlation Matrix between predictor and outcome variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.Chron Health Cond(s)	1																			
2.Percep t (+ve) Health	-.475**	1																		
3.Psych Log10	.249**	-.525**	1																	
4.Depr Log10	.240**	-.483**	.925**	1																
5.Anx Log10	.347**	-.572**	.877**	.782**	1															
6.Stress L10	.101	-.378**	.903**	.755**	.670**	1														
7.Cog Fusion	.146*	-.358**	.649**	.626**	.527**	.600**	1													
8.Exper Avoid	.234**	-.359**	.436**	.433**	.457**	.314**	.359**	1												
9.Engag Living	-.003	.264**	-.378**	-.445**	-.299**	-.295**	-.388**	-.512**	1											
10.Psych Inflex	.143	-.367**	.688**	.703**	.578**	.588**	.676**	.527**	-.512**	1										

11.Qual of Life	-.487**	.698**	-593**	-.557**	-.644**	-.415**	-.428**	-.365**	.152**	-.403**	1									
12.Elect Select	.001	.064	-.165*	-.164*	-.130	-.125	-.105	-.074	.218**	-.168**	.043	1								
13.Loss Based Select	-.039	.094	-.101	-.072	-.149*	-.040	.038	-.185**	.140	-.080	.095	.602**	1							
14. Optimis	.102	.230**	-.182*	-.172*	-.207**	-.085	-.110	-.269**	.268**	-.280**	.196**	.417**	.498**	1						
15. Compen	.021	.201**	-.161*	-.149*	-.151*	-.112	-.040	-.241**	.243**	-.141	.134*	.427**	.592**	.598**	1					
16.SOC	.077	.181*	-.180	-.181*	-.207**	-.077	-.092	-.222**	.252**	-.219**	.162*	.692**	.780**	.728**	.709**	1				
17. Gender	.023	.074	-.097	-.035	-.051	-.143	-.201	.-.088	.020	-.119	.089	.092	.085	.064	.002	.059	1			
18. Age	.165*	-.062	.107	.102	.131	.052	-.006	.074	-.051	.054	-.091	.114	-.006	-.059	-.077	-.003	.186*	1		
19. Prev MH Treat	.063	-.184*	.299	.276**	.339**	.230**	.253**	.288**	-.078	.215**	-.218**	-.028	-.016	-.026	-.012	-.001	-.041	-.155**	1	
20. Curr MH Treat	.118	-.191*	.211**	.228**	.242**	.131	.240**	.130	-.086	.189**	-.136	-.031	-.023	-.066	-.081	-.066	-.049	-.092	.691**	1

All correlations are Spearman's; n=187; SOC: Selection, Optimisation and Compensation.

** correlation is significant at the 0.01 level (2 tailed)

* correlation is significant at the 0.05 level (2 tailed)

Variables that did not significantly correlate with the outcome variables were excluded from the regression analysis, as suggested by Tabachnick & Fidell (2006). Only including variables that correlated with the outcome variables also preserves power. The final sample of 187 participants is sufficiently powered to detect medium effect sizes or larger with the 7 predictor variables retained (alpha=.05; Beta=.80; Green, 1991).

Multivariate Analyses

Predictor of Psychopathology

To test the relative strength of each of the constructs, which demonstrated a significant correlation in the previous analysis, in predicting symptoms of psychopathology, including depression, anxiety and stress, they were entered into three forced entry linear regression models (see table 5).

The seven explanatory variables were entered into the regression model and analysis revealed that collectively they explained 59.4% of the variance in depression scores ($p<.0001$). Individually, cognitive fusion ($p=0.002$), psychological inflexibility ($p<.0001$), and perception of health ($p<.0001$) were significant predictors of depression.

With regard to anxiety, the ten explanatory variables collectively explained 52.4% of the variance in anxiety scores ($p<.0001$). Cognitive fusion ($p=0.011$), experiential avoidance ($p=0.038$), psychological inflexibility ($p=0.002$), and perception of health ($p<.0001$) all had a significant individual predictive effect on anxiety scores.

Collectively the ten explanatory variables accounted for 46.5% of the variance in stress scores ($p<.0001$). Further, cognitive fusion ($p<.0001$), psychological inflexibility ($p<.0001$), and perception of health ($p=0.014$) had a significant individual predictive effect on stress scores.

Table 5

Predictors of Psychopathology

Variables	Beta	t	p	R-sq	Adj.R-sq	F	p
DV DASS DEPRESSION				.594	.517	25.444	<.0001
Fusion	.22	3.175	.002				
Exp Avoidance	.045	.737	.462				
Engaged Living	-.072	-1.248	.214				
Psych Inflexibility	.425	5.451	<.0001				
Percept of Health	-.225	-4.095	<.0001				
Selection ES	-.057	-.820	.414				
Selection LB	.015	.181	.857				
Optimisation	.114	1.516	.131				
Compensation	-.044	-.615	.539				
SOC	-.022	-.185	.853				
DV DASS ANXIETY				.524	.497	19.176	<.0001
Fusion	.190	2.586	.011				
Exp Avoidance	.138	2.068	.038				
Engaged Living	-.058	-0.920	.359				
Psych Inflexibility	.272	3.224	.002				
Percept of Health	-.372	-6.265	<.0001				
Selection ES	-.011	-.140	.889				
Selection LB	-.114	-1.288	.199				
Optimisation	.044	.546	.586				
Compensation	.046	.595	.553				
SOC	-.029	-.230	.819				
DV DASS STRESS				.465	.435	15.148	<.0001
Fusion	.345	4.419	<.0001				
Exp Avoidance	-.009	-.128	.898				
Engaged Living	-.051	-.765	.445				
Psych Inflexibility	.355	3.971	<.0001				
Percept of Health	-.156	-2.475	.014				
Selection ES	-.112	-1.397	.164				

Selection LB	-.092	-.987	.325
Optimisation	.075	.871	.385
Compensation	-.149	-1.814	.071
SOC	.247	1.840	.067

Method: simultaneous forced entry

Predictors of Quality of Life

In a similar way to depression, to test the relative strength of each of the constructs, which demonstrated a significant correlation in the previous analysis, in predicting quality of life, they were entered into three forced entry linear regression models (see table 6).

The ten explanatory variables were entered into the regression model and analysis revealed that collectively they explained 57.9% of the variance in quality of life ($p<0.001$). Individually, cognitive fusion ($p=0.005$), engaged living ($p=0.042$), perception of health ($p<0.001$), and use of SOC strategies ($p=0.002$) were significant predictors of quality of life.

Table 6

Predictors of Quality of Life

Variables	Beta	t	p	R-sq	Adj.R-sq	F	p
QOL EQD5				.579	.552	21.598	<.001
Fusion	.197	2.833	.005				
Exp Avoidance	.057	.906	.366				
Engaged Living	.123	2.050	.042				
Psych Inflexibility	.084	1.051	.295				
Percept of Health	-.512	-8.141	<.001				
Selection ES	.045	.688	.492				
Selection LB	-.073	-1.013	.312				
Optimisation	-.023	-.343	.732				
Compensation	.015	.213	.832				
SOC	.185	3.162	.002				

For all regression analyses, the regression diagnostics were acceptable. Examination of the standardised residual plots indicated that the assumptions or normality and linearity were met.

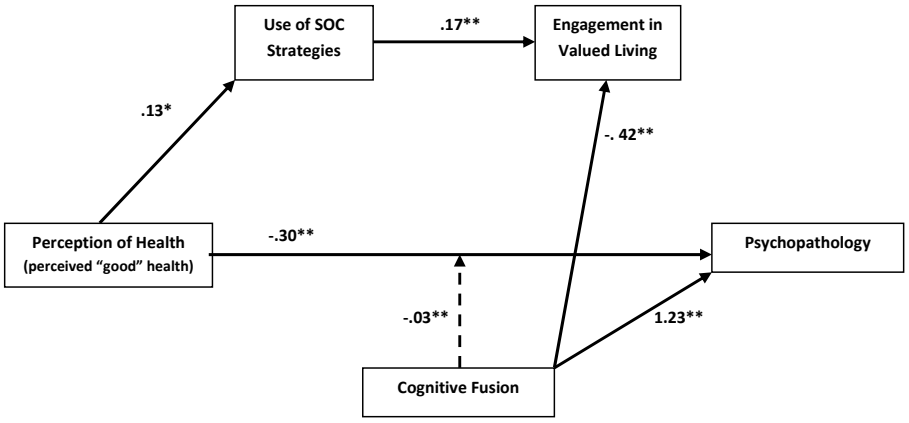
Durbin Watson statistics were close to 2 suggesting that the assumption of homogeneity of variance was met. Finally, Cook's distance and Mahalanobis distance were within acceptable limits for both models (Field, 2013).

Conditional Process Analysis

Conditional process analysis (Hayes, 2013; 2014) is a method for testing complex relationships between variables including determining direct influences between predictor and outcome variables, whilst also modelling any indirect effects via mediating variables, or moderating effects of other variables. Using a combination of theoretical prediction, and preliminary data analysis using correlation and regression, a model was specified a priori in which it was hypothesised that it is the subjective perception of one's health, rather than ones objective health status, that will influence the experience of psychopathology, including depression, anxiety and stress, directly, as well as indirectly via the use of selective optimisation and compensation strategies, and engagement in valued living. It was also hypothesised that this path (perceiving one's health to be poor, use of SOC strategies, and engagement in valued living) would be moderated by cognitive fusion in that individuals lower in cognitive fusion, would be more likely to engage in SOC strategies and would be more likely to engaged in values based living, thus buffering the relationship between poor perception of health and psychopathology. Previous research has suggested that cognitive fusion could be a better predictor of cognitive variables such as thinking, than is psychological inflexibility (Gillanders et al., 2014). Therefore, because perception of health is a cognitive construct, it was predicted that cognitive fusion, rather than overall psychological flexibility, would moderate these paths.

In figures 1-4 the solid lines represent direct effects, dotted lines represent indirect effects, and dashed lines represent moderating effects. The numbers on the lines represent the standardised beta coefficients. Only significant paths are demonstrated in order to avoid the figures becoming cluttered and difficult to interpret. Each figure also contains a table demonstrating the results of the conditional process analysis. Numbers in each row are bootstrapped confidence intervals (BCI) of 10,000 resamples. If these confidence intervals do not contain zero, the effect of that path is considered to be significant at a p value of less than 0.05. The overall variance explained by each model is also noted.

Psychopathology (figure 1)



Key:

Direct path Indirect path Moderator

** significant at the 0.01 level

* significant at the 0.05 level

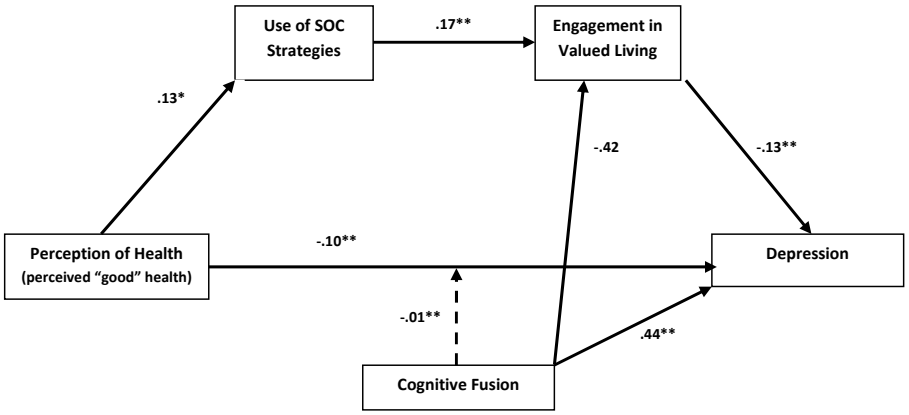
Path	BCI	
	LL	UL
Direct effect perception of health to psychopathology	-.4429	-.1643
Total indirect effect	-.0775	.0126
Perception of health to use of SOC strategies to psychopathology	-.0775	.0126
Perception of health to use of SOC strategies to engagement in valued living to psychopathology	-.0121	.0023
Perception of health to engagement in valued living to psychopathology	-.0342	.0114
Total model: Rsq=.5690, p<0.05 BCI= Bootstrapped confidence interval; LL= Lower Limit; UL= Upper Limit.		

For the model predicting psychopathology, the overall model was found to explain 56.9% of the variance in psychopathology, or total DASS score. Perception of health was found to be significantly negatively related to psychopathology (b=-.30; 95% CI -.44,-.16; t=-4.30; p<.001). Cognitive fusion was significantly positively related to psychopathology (b=1.23; 95% CI .93, 1.53; t=8.04; p<.001). However, interestingly, neither the use of SOC strategies nor engagement in valued living predicted psychopathology directly. Perception of health was found to lead to the use of SOC strategies (b=.13; 95% CI .01, .25; t=2.08; p=0.04), which in turn led to engagement in values based living (b=.17; 95% CI.29,.06; t=2.98; p=0.01). Cognitive fusion was also found to directly impact upon engaged living (b=-.42; 95% CI -.22, -.62; t=-4.19; p<.001). In the significant moderator effect of cognitive fusion, cognitive fusion significantly affected the relationship between perception of "good" health and psychopathology (b=-.03; 95% CI -.05, -.02; t=-4.01; p<.001). Interestingly, there

were no mediation effects of SOC or ELS on the relationship between perception of health and psychopathology.

Further analysis using simple slopes demonstrated that when cognitive fusion is low, there is a non-significant relationship between perception of health and psychopathology (b=-.10; 95% CI=-.30, -.11; t=-.93; p=0.36). However, at the mean value of cognitive fusion and high levels of fusion, there is a significant negative relationship between perception of health and psychopathology (b=-.33; 95% CI= -.47, -.19; t=-4.74; p<.001; b=-.57 95% CI= -.71, - .42; t=-7.58; p<.001). Thus, from the mean value of cognitive fusion and above, as perception of health increases symptoms of psychopathology decrease.

Depression (figure 2)



** significant at the 0.01 level

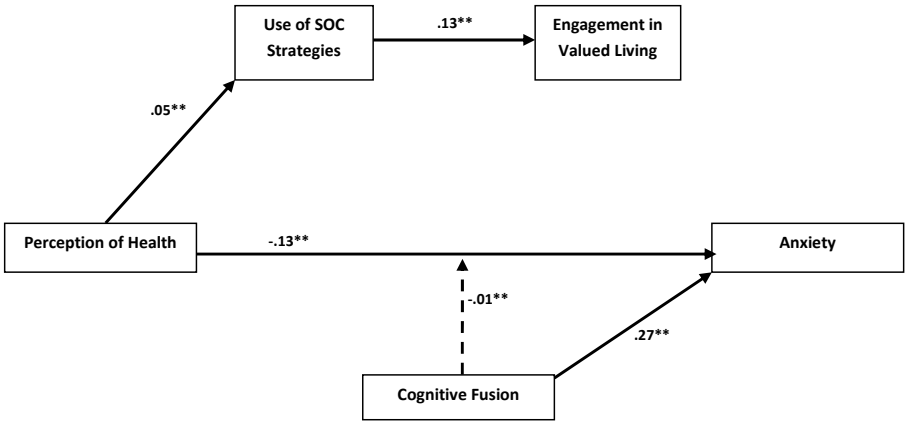
* significant at the 0.05 level

Path	BCI	
	LL	UL
Direct effect perception of health to depression	-.1562	-.0423
Total indirect effect	-.0372	.0045
Perception of health to use of SOC strategies to depression	-.0196	.0065
Perception of health to use of SOC strategies to engagement in valued living to depression	-.0088	.0002
Perception of health to engagement in valued living to depression	-.0243	.0073
Total model: Rsq=.5315, p<0.05 BCI= Bootstrapped confidence interval; LL= Lower Limit; UL= Upper Limit.		

For the model predicting psychopathology, the overall model was found to explain 53.2% of the variance in depression. Perception of good health was found to be significantly negatively related to depression (b=-.10; 95% CI -.16,-.04; t=-3.44; p=0.01). It was also found to be positively related to the use of SOC strategies in that as perception of "good" health increases, use of SOC strategies also increase (b=.13; 95% CI .01, .25; t=2.08; p=0.04). In turn, a significant positive relationship was found between use of SOC and engagement in valued living so as SOC use increases, values based living also increases (b=.17; 95% CI .03, .06; t=2.98; p=0.01). Engaged living was then found to be significantly negatively related to depression (b=-.13; 95% CI -.04, -.22; t=2.98; p=0.01), which suggests that use of SOC and engagement in values based living are parallel processes which affect symptoms of depression directly. Cognitive fusion was significantly positively related to depression (b=.44; 95% CI .32, .57; t=7.11; p<.001) so that as fusion with thoughts increases, symptoms of depression also increase. Cognitive fusion was also found to significantly negatively affect values based living (b=-.42; 95% CI -.22, -.62; t=-7.11; p<.001). In the significant moderator effect of cognitive fusion, it appears that lower levels of cognitive fusion were found moderate the impact of perceived "good" health on reduced levels of depression (b=-.01; 95% CI -.00,-.04; t=-3.27; p<.001). However, the BCI contains zero in this case, so this finding must be interpreted with caution. Again, there were no mediation effects of SOC or ELS on the relationship between perception of health and psychopathology.

Further analysis using simple slopes demonstrated that when cognitive fusion is low, there is a non-significant relationship between perception of health and depression (b=-.03; 95% CI=-.12, .05; t=-.74; p=0.46). However, at the mean value and high values of cognitive fusion, there is a significant negative relationship between perception of good health and lower levels of depression (b=-.11; 95% CI= -.17, -.06; t=-3.93; p<.001; b=-.20; 95% CI= -.29, - .145; t=-6.32; p<.001). Thus, from the mean value of cognitive fusion and above, as perception of health increases symptoms of depression decrease.

Anxiety (figure 3)



** significant at the 0.01 level

* significant at the 0.05 level

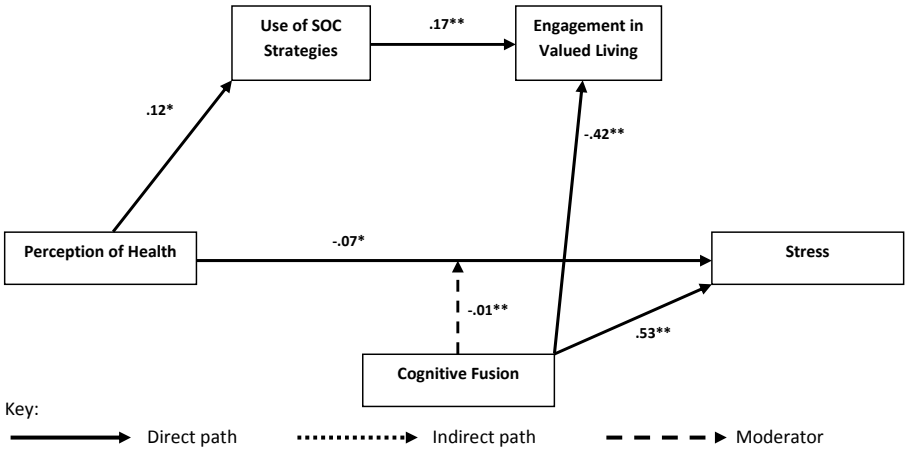
Path	BCI	
	LL	UL
Direct effect perception of health to anxiety	-.1821	-.0869
Total indirect effect	-.0236	.0046
Perception of health to use of SOC strategies to anxiety	-.0213	.0018
Perception of health to use of SOC strategies to engagement in valued living to anxiety	-.0023	.0019
Perception of health to engagement in valued living to anxiety	-.0063	.0060
Total model: Rsq=.5155 ,p<0.05 BCI= Bootstrapped confidence interval; LL= Lower Limit; UL= Upper Limit.		

For the model predicting psychopathology, the overall model was found to explain 51.6% of the variance in anxiety. The perception of "good" health was found to be significantly negatively related to anxiety symptoms (b=-.13; 95% CI -.18,-.08; t=-5.58; p<.001) so the more positively one perceives their health, the less likely they are to experience anxiety symptoms. The perception of "good" health was significantly related to the use of SOC strategies (b=.05; 95% CI .15, .04; t=1.07; p=0.01), which in turn led to greater engagement in value based living b=.13; 95% CI.29, .06; t=2.98; p=0.01). Cognitive fusion was significantly positively related to anxiety meaning that when an individual is more fused with their thinking, they are likely to experience higher levels of anxiety (b=.27; 95% CI .16, .37; t=5.08 p<.001). However, interestingly, neither the use of SOC strategies nor engagement in valued living predicted psychopathology directly. In the significant moderator effect of cognitive

fusion, higher levels of cognitive fusion were found to moderate the relationship between "good" perception of health and anxiety so that the more fused someone is with their thoughts. Thus, from the mean value of cognitive fusion and above, as perception of health increases symptoms of anxiety decrease (b=-.01; 95% CI -.02,-.01; t=-4.70; p<.001). Again, there were no mediation effects of SOC or ELS on the relationship between perception of health and psychopathology.

Further analysis using simple slopes demonstrated that when cognitive fusion is low, there is a non-significant moderating effect in the relationship between perception of "good" health and psychopathology so the perception of being in "good" health reduces the symptoms of psychopathology (b=-.05; 95% CI=-.12, .02; t=-1.46; p=0.15). However, at the mean value, or high value of cognitive fusion, there is a significant negative relationship between perception of health and anxiety (b=-.14; 95% CI= -.19, -.10; t=-6.00; p<.001; b=-.23 95% CI= -.28, - .18; t=-9.19 p<.001). Thus, from the mean value of cognitive fusion and above, as perception of health increases symptoms of anxiety decrease.

Stress (figure 4)



** significant at the 0.01 level
* significant at the 0.05 level

Path	BCI	
	LL	UL
Direct effect perception of health to stress	-.1336	-.0030
Total indirect effect	-.0198	.0167
Perception of health to use of SOC strategies to stress	-.0131	.0152
Perception of health to use of SOC strategies to engagement in valued living to stress	-.0039	.0022
Perception of health to engagement in valued living to stress	-.0125	.0063
Total model: Rsq=.4086,p<0.05 BCI= Bootstrapped confidence interval; LL= Lower Limit; UL= Upper Limit.		

For the model predicting stress, the overall model was found to explain 40.9% of the variance in stress. Perception of health was found to be significantly negatively related to stress (b=-.07; 95% CI -.13,-.00; t=-2.07; p=0.04) in that as perception of "good" health increases, stress decreases. Perception of health was significantly positively related to the use of SOC strategies (b=.13; 95% CI .01, .25; t=2.08; p=0.04), which in turn led to greater engagement in value based living (b=.17; 95% CI .29, .06; t=2.98; p=0.04). There was also a significant negative relationship between cognitive fusion and engaged living (b=-.42; 95% CI -.22, -.62; t=-4.19; p<.001) in that when fusion with thinking increases, value based living decreases. Cognitive fusion was also significantly associated with stress, but this time positively so as people become more fused, their levels of stress increase (b=.53; 95% CI .39, .67; t=7.41; p<.001). However, interestingly, neither the use of SOC strategies nor engagement in valued living predicted psychopathology directly. In the significant moderator effect of cognitive fusion, higher levels of cognitive fusion were found to change the relationship between perception of good health on stress (b=-.01; 95% CI -.01, -.00; t=-2.16; p=0.03) so that perception of "good" health is less influential in terms of reducing stress levels . Again, there were no mediation effects of SOC or ELS on the relationship between perception of health and stress

Further analysis using simple slopes demonstrated that when cognitive fusion is low, there is a non-significant relationship between perception of health and stress (b=-.01; 95% CI=-.11, .08; t=-.24; p=0.81) i.e. perception of "good" health is not significantly related to the reduction of stress levels. However, at the mean value, or high value of cognitive fusion, there is a significant negative relationship between perception of health and stress (b=-.07; 95% CI= -.14, -.01; t=-2.20; p=0.03; b=-.13; 95% CI= -.20, -.06; t=-3.77; p<.001). Thus, from the mean value of cognitive fusion and above, as perception of "good" health increases symptoms of stress decrease.

~~Discussion~~

Summary of Results

The contribution of this study is three-fold. Firstly, it offers a novel contribution with regards to comparing the relative predictive power of Acceptance and Commitment Thearpy constructs in a population of older people. Further, it explored the impact of various psychological predictors of distress and quality of life in older people, adding to our understanding of mental wellbeing in the context of age. And finally, this study tests the explanatory power of a theory driven model, in which the constructs exert influence in arriving at important outcomes such as psychological distress and quality of life. Specifically, findings demonstrated that the perception of positive health is associated with the use of positive coping strategies, namely increased use of Selection, Optimisation and Compensation; ACT related variables; and measures of distress. This suggests that the perception of one's health in later life is a significant factor in coping, wellbeing and quality of life.

Linear regression analysis provided a measure of each construct's unique exploratory variance in the extent of psychological distress experienced. This was particularly helpful in comparing models and the theoretical predictions that can be derived from them. In this study, the perception of positive health and the extent of cognitive fusion was found to predict symptoms of depression, anxiety and stress, as well as quality of life. Further, cognitive fusion was found to be an individual predictor of distress, while experiential avoidance predicted depressive symptoms only. Quality of life was individually predicted by engagement in values based living, and the use of SOC strategies.

The findings of the conditional process analysis suggest that it is the perception of health, as opposed to age, or the actual experience of chronic conditions, which directly infleunces psychological distress and quality of life in older people, as well as indirectly via the use of SOC strategies and greater engagement in values based living (consistent with the ACT model). In this theoretically driven model, both cognitive fusion, and experiential avoidance constructs represent potent treatment targets in the reduction of psychological distress, including depression and anxiety in older people, andw ere found to be moderators of these relationships. This finding replicates the work of Gillanders and colleagues (2014) who demonstrated that cognitive fusion was a more robust exploratory variable in comparison to psychological flexibility in studies utilising cognitive, or thinking-based predictor variables. In each of the four outcome variables measured in this study, the model was ofund to explain a large amount of the variance between the perception of positive

health, and the xperience of psychological distress including anxiety, depression and stress. Specifically, the moderating effect of cognitive fusion was found to be significant in that at both average, and high levels of fusion with thinking, a significant negative relationship was demonstrated between the perception of 'good' health, and psychological distress. This finding is particularlyl interesting as it is the first instance of an empirical study finding fusion to moderate relationships in a positive way. Thus, findings from this study suggest that the more fused you are with thinking in general, if you have perceptions of 'good' or positive health, this is protective against psychological distress. The model also highlighted specific direct relationships between variables, which will be discussed in detail in relation to the theoretical and clinical implications of the study,

Theoretical Implications

Gerontological Theroy

When considering contribution of the current study in the context of gerontological theory, a number of significant issues are raised. First and foremost, the study did not find a significant effect of increasing age on the xperience of psychological distress, which suggests that the oldest old in the sample did not experience greater symptoms of depression or anxiety than their younger old, or pre-older age counterparts. This finding is congruent with the so called 'paradox of wellbeing' in older age (Mroczek & Kolars, 1998), which suggest that ageing associated losses, such as declining physical and cognitive functioning, do not affect the emotional state of older people as expected, and in fact, many older people consider themselves to be ageing successfully (Montross et al., 2006) and report increased subjective wellbeing with age (Gana et al., 2013).

In terms of a lifespan development take on ageing, which suggests that the balance of gains and losses is shifted to a higher proportion of losses in ageing.

Interestingly, the findings of the current study do not offer empirical support for socioemotional selectivity theory, which argues that increasing age and reduced time horizons are associated in a natural shift in motivation that emphasised emotion and meaning in life (Charles & Carstensen, 2010), in which goals are though to become more focused on the quality of relationships, emotional meaning and enhanced appreciation of life (Carstensen & Lockenhoff, 2006). However, in this study age was not found to be associated with greater life meaning or greater engagement with values, which is a direct contrast to the core of SST.

Of particular interest to this study is the unique context of ageing within a Scottish population, and this is considered throughout interpretation and discussion of findings.

However, findings did provide some empirical support for the theory of selection, optimisation, and compensation. Previous research has named older people as the cohort best suited to the application of SOC due to the increased in age related changes in this population (Baltes & Baltes, 1990) and the associated increased requirement for SOC strategies in adapting to age related losses (Baltes, 1993). However, it was the perception of health, as opposed to age, which was associated with increased use of SOC strategies in this study. This suggests that older people who perceive themselves to be healthy, are more likely to use SOC strategies, and are thus less likely to experience psychological distress than those who perceive themselves to be subject to poor health. This finding suggests that health and illness perceptions are influential in an individual's ability to engage in strategies which promote successful ageing. As cognitive fusion was found to be a moderating variable in this relationship, it is likely that individuals who perceive themselves to have poor health become fused with their thoughts regarding this, which prevents them from engaging in strategies to manage these age related losses.

This has significant implications when considering the findings of the current study in a Scottish context. Scotland experiences significant inequalities in health, social, and financial factors. For example, inequality exists within life expectancy, where in the most deprived areas of Scotland life expectancy is lower, three years for men and two for women in comparison to more affluent areas (Clark, McKeon, Sutton, & Wood, 2004). This finding relates to the so-called 'Glasgow effect' in which stark contrast exists in the health of poor inner city communities in comparison to affluent suburbs only a few miles away (Walsh, Bendel, Jones, & Hanlon, 2010). In a similar vein, Scotland is subject to increasing pensioner poverty and the shift towards a higher retirement age (currently 68 years in Scotland) there will be a shift in responsibility and risk towards the individual with increasing financial independence (Coole, 2012). Thus, if individuals perceive themselves to have poor health, and become fused with their thoughts about this and the idea that they must take responsibility for their health, this will prevent them from engaging in strategies to manage these age related losses.

The findings of the current study also raise the question about the value in separate theories due to the significant overlap between constructs, for example engaged living and the use of SOC strategies. The question arising is really whether these constructs are pragmatically different ways of saying the same thing. The findings from the current study suggest that the use of SOC strategies may be subsumed by engaged living. In this sense, engaged living appears to be an overarching concept in which use of SOC strategies is one method of achieving this. From an ACT perspective,

values can be considered to be an intrinsic motivational framework for leading a meaningful life. The process of committed action to these values helps people to translate their overarching values into smaller goals and steps in the shorter term. Thus, engaged living appears to function at a deeper level than the behavioural strategies of SOC. This lends to the idea that the use of SOC strategies can enhance values based living in a behavioural sense or that values are SOC are arranged hierarchically in which valuing contains the use of SOC to pursue valued living. However, this goes beyond the data in this study and is considered at a conceptual level. The extent of overlap in structures from contextual behavioural science and theories of gerontology is an interesting philosophical and conceptual idea to explore. It may be that applying ACT with other people could benefit from a wider theoretical lens in order to take account of theories such as SOC and socioemotional selectivity theory in the hope of learning more about successful ageing.

Cognitive Behavioural Therapy vs Acceptance and Commit

Further, the current study found the perception of positive health to be significantly directly and negatively related to all forms of psychological distress. Thus, it is an individual's subjective perception of health and thinking style, as opposed to the objective experience of illness and disability, which is predictive of experiencing symptoms of depression, anxiety or stress in later life. As such, it may be inferred that the type of cognitive style which supports an individual to have a positive outlook on their health in the context of ageing, is also likely to enable them to employ coping strategies which are known to be associated with successful ageing. This finding reinforces work regarding illness perceptions, and supports the cognitive model in understanding common mental health problems in later life (Satre, Knight, & David, 2006).

The findings of the current study support the idea that cognitive models of psychological problems in ageing can address the complex clinical issues found in this population e.g. a high degree of comorbidity (Satre, Knight, & David, 2006). Thus, the study lends itself to provide theoretical support for the development and application of interventions which focus on changing health and illness appraisals from a cognitive psychology perspective, which has typically involved cognitive behavioural approaches. Alternatively, support is also offered to ACT, a so called third wave cognitive approach. Results from conditional process analysis suggests that cognitive fusion and values based living, constructs from the overarching ACT model, are central to our understanding of the development of psychological distress in later life. The significant relationship between fusion in thinking and depression, anxiety, and stress suggests that it is the way in which one interacts with, or relates to thoughts which is key in the extent to which they experience distress. Fusion has been

described as a key process which threatens psychological flexibility (Hayes, 2004; Hayes, Strosahl, & Wilson, 1999). It can result in identification with one's thoughts and an inability to consider them as part of an inner experience rather than fact, which leads to taking an objective attitude towards them (Eifert et al., 2009). Cognitive fusion was a significant moderator of the relationship between perception of health and psychopathology, which suggests that it is a key player in understanding the experience of well being and quality of life in ageing. It is hypothesised that individuals who are more cognitively fused with a perception of poor health, are less likely to be able to apply helpful coping strategies, and more likely to experience psychological distress in ageing. It may be that cognitive fusion prevents individuals from seeking coping strategies, or renders them helpless in their situation. While additional research is clearly needed to clarify these constructs within psychological models, this study does provide an initial step in synergising cognitive content, cognitive fusion, and overt behavioural strategies which could build useful bridges between areas of psychology.

Specifically, the perception of positive health was associated with the use of selection, optimisation, and compensation strategies; ACT related variables; and measures of distress. This suggests that the perception of one's health is considerably influential in their ability to cope, their well being, and their quality of life in ageing.

As the study did not find any relationship between ACT based variables and age, this suggests that there are no significant differences in these psychological processes across the adult life span. ACT has been shown to be an efficacious intervention in a range of psychological problems in a younger adult population. As there does not appear to be any qualitative differences in the key constructs of the ACT model in older people, this suggests that ACT based approaches are likely to be as efficacious as they have been with younger adults.

Further, the finding that cognitive fusion significantly predicts the experience of all types of psychopathology explored in the study suggests that it may be a potentially useful target in treatment and preventive interventions for common mental health problems in later life. This raises

an interesting point. If fusion is also moderating the relationship between perception of positive health and reduced pathology, it may be beneficial for people to retain some fusion. However, when considering the model overall, it appears that the strength of this relationship is less convincing than the direct relationship from fusion to pathology in all cases, thus fusion appears to offer a possibility for intervention focus, without much consequence to the good health perception path. This finding provides further weight to the argument for the use of an ACT based approach with older people, as results demonstrated that reducing an individual's fusion with their thoughts could result in a significant reduction in symptoms of psychopathology. Further, as the study did not find any relationship between ACT based variables and age, this suggests that there are no significant differences in these psychological processes across the adult life span. ACT has been shown to be an efficacious intervention in a range of psychological problems in a younger adult population. As there does not appear to be any qualitative differences in the key constructs of the ACT model in older people, this suggests that ACT based approaches are likely to be as efficacious as they have been with younger adults.

Clinical Implications of Study Findings

As stated above, the findings of the current study appear to provide evidence in support of both a cognitive theory perspective of common mental health problems in later life, as well as one from Contextual Behavioural Science, and Acceptance and Commitment Therapy. To date, cognitive behavioural approaches have dominated interventions for late life depression and anxiety (Cuijpers, Straten & Smith, 2006; Ayers, Sorrell & Thorp, 2007). Findings for depression have demonstrated a similar level of efficacy in comparison to younger people, however studies examining anxiety disorders in late life are less well established and have struggled to provide clear evidence of efficacy. There has been debate within the CBT field regarding whether therapy needs to be qualitatively different when working with older people. Laidlaw (2010) provides an alternative model and formulation for late life depression in which issues specific to older people are addressed. The findings of this study provide some support for an adapted form of CBT, as while illness perceptions are shown to be central to the development of psychopathology, other variables associated with age have also been highlighted within the model and findings. Changes in later life in line with those stated in Socioemotional Selectivity Theory and Selection, Optimisation and Compensation theory appear to be influential in relationships between cognition and pathology in this study. Thus, findings support the use of an adapted form of CBT which specifically addresses the unique complexities of later life. This highlights the need for specific training in providing CBT for older people. In particular it seems that training in theoretical perspectives of ageing such as SOC

and SST would be beneficial in supporting mental health professionals to understand the different time frame within which older people operate, which has considerable implications for the delivery of therapy.

ACT on the other hand has also demonstrated promising treatment effects in samples of older people experiencing chronic pain and a preliminary study of late life generalised anxiety disorder (Wetherell et al., 2011a,b). The finding that psychological flexibility does not change substantially with age provides theoretical support for an ACT based approach and suggests that it may be equally effective in older people in comparison to younger adults where it has been shown to be effective in a range of populations (see A-Tjak, Davis, Morina, Powers, Smits & Emmelkamp, 2015 for a review). Additional research should endeavour to evaluate the active components of ACT interventions and compare whether or not there is any difference in this between younger and older populations. This would offer further evidence for the clinical utility of ACT in later life.

Another avenue for potential research is to investigate an ACT-SOC combination therapy approach. The findings of this study suggest that providing training in the use of SOC strategies may have a positive impact on values based living, quality of life and psychopathology in older people. There appears to be considerable overlap between the ACT and SOC model and previous research has offered a preliminary investigation regarding the merging of these two models to create a specific intervention for older people in residential care experiencing chronic pain (Alonso-Fernandez, Lopez-Lopez, Losada, Gonzales, & Wetherell, 2014). An ACT intervention combined with training in SOC strategies was found to improve emotional well being and functional capability. Significant ($p=0.05$) time by intervention changes were found in acceptance, pain related anxiety, use of compensation strategies, and pain interfering with walking ability. Simple effect changes were found in acceptance, selection strategies, catastrophizing beliefs, and depressive symptoms.

Not only do the findings from the current study provide support for ACT based treatments in later life, it seems that preventive approaches employing ACT/SOC may also be worth exploring in this population. The clear relationship between cognitive fusion and psychopathology, and use of SOC strategies and engagement in values based living offers focus for preventive interventions. Cultivating the appropriate use of SOC strategies, and increasing engagement in valued living is likely to reduce distress in ageing, even in the presence of negative perception of health. Further because the sample included in this study were subclinical, the clear relationship between cognitive fusion

and psychopathology suggests that fusion may be an ideal target for intervention, whether this is treatment based or preventative.

Further, of particular interest is the finding that perceptions of positive health increased the use of SOC strategies in a sample who were not depressed or anxious, and who did not demonstrate a high level of functional disability. This may be partially explained by the incorporation of both reactive (e.g. loss based selection), and proactive (e.g. elective selection) and suggests that even prior to illness, the use of SOC strategies may be efficacious in maintaining well being and preventing pathology. However, these findings are preliminary and future research is required to explore the use of a combined ACT and SOC intervention in other groups of older people, for example those with chronic physical health problems or disability, those with cognitive decline, and individuals identified as at risk of common mental health problems in later life as a preventative strategy.

In a similar vein, the demonstration of a clear relationship between perception of poor health and increased psychopathology, including depression, anxiety and stress, highlights a new risk factor for common mental health problems in late life. A deeper analysis of risk factors in this context is still needed and focusing specifically on age related risk is imperative due to the number of critical experiences that can occur during this period e.g. bereavement, social isolation, functional and cognitive impairment, etc. (Weyerer et al., 2008). This study suggests that it is the perception of health, as opposed to the experience of chronic conditions which may be a key risk factor in the development of late life depression or anxiety.

Further research should investigate how best to measure and quantify this risk factor in order for it to be a clinically useful indicator of risk. From this it is possible to explore the potential of preventive interventions to reduce the incidence of common mental health problems in late life. Further, as stress is known to be a predictor of the development of a diagnosable mental health problem across the age span (Hammenm 2005), the findings of this study suggest that symptoms of stress may be another valuable indicator of risk which could be relatively easily measured in primary care. As older people are more likely to discuss psychological symptoms with their General Practitioner, the validation of swift, easily administered screening tools is imperative to increase the recognition rate of at risk older people, which has been highlighted as consistently poor in this population (Crawford, Prince, Menezes, & Mann, 1998).

In considering these theoretical perspectives in a Scottish context, it must be acknowledged that while health and social care are devolved to the Scottish Government and health is free at the point

of access, private and third sector care are also significant providers of health and social care in Scotland. As older people constitute the main users of health and social care services, the increasingly ageing population in Scotland will continue to require a high level of support from these services (Department of Health, 2010a).

The importance of community development and or prevention and early intervention in the reality of diminishing resources for health and social care providers has prompted the government to explore alternative ways of supporting older people through innovative and preventative programmes (Department of Health, 2010a). Preventative programmes have been operating through charitable and community organisagtions for many years and may be called upon to provide services to the ageing population, particular those which provide programmes contrinuting to positive health and wellbeing and successful ageing. Preventative programmes are those that seek to promote independence and wellbeing and reduce the risk of crises and maximising peoples functioning (Dept of Health, 2010a). Aspects of prevention are congruent with successful ageing, which is characterised by low probability of disease, and disease related disability, high cognitive and physical functional capacity and active engagement with life (Rowe & Kahn, 1987). Active engagement with life involves interpersonal relationships as well as productive activity, which creates a sense of societal value (Rowe & Kahn, 1997). Social isolation is common in older people in Scotland and is a risk factor for health and mortality (e.g. Heffner et al., 2011). Thus, the development of social and active preventative and early intervention programmes is crucial in supporting the success of an increasingly ageing population in Scotland. Health and social care services are encouraged to break down boundaries and begin to work more closely to combat the current and ongoing difficulties in order to enhance efficiency and work towards the best outcomes for older people (Dept of Healtj, 2009b, c).

However, any of the aforementioned interventions, whether preventative or treatment level, rely on the accurate detection of risk factors for common mental health problems in later life, or the identification and diagnosis of clinical manifestation of such. Research consistently highlights that recognition of mental health problems in older people is poor in comparison to their younger counterparts and progress regarding the routine identification of risk factors is even less well established in this context. Primary care practitioners should be supported in this work from an organisational perspective. Clear assessment tools and care pathways for individuals identified to be at risk, or experiencing clinically significant symptoms of mental health problems in later life would offer a clear procedure for busy primary care practitioners. Further, previous research has highlighted that mental health care provided in the primary care setting is beneficial in the treatment of older people as collaboration in care and communication between practitioners increases (Unutzer, 2003). These approaches require further investment in training in the identification or common mental health problems in later life, as well as the identification of risk factors in subclinical individuals. In order to truly improve recognition of symptoms of psychological

illness in older people, this type of training should be multidisciplinary and at various levels of service provision e.g. primary care and secondary care. However, any change in service provision would need to be supported by policy drivers set at national level, which requires a stronger focus on prevention, identification, and treatment of mental illness among older people.

Limitations

The current study has a number of limitations. Firstly, in terms of the methodological design, the use of self-report measures may have introduced an element of subjective bias to study findings. In terms of the measurement of depression, Watson, Lewis, Kistler, Amick, & Boustani (2004) suggest, conventional instruments are inappropriate for assessing depression in the old-old and oldest-old in that standardised cut off points can underestimate major depression in late life. This is supported by Nguyen & Zonderman (2006) who observed that standardised self-report measures tend to indicate a positive curvilinear or (u shaped) pattern of late life depression, whereas clinical diagnoses tend to indicate a negative curvilinear pattern. This would fit with the data collected in this study where depression was found to have a positive skew, and even after data transformation procedures, it continued to fit a positive curvilinear pattern because most of the sample were not depressed. Future investigations should carefully consider the measurement of variables in this unique population. An additional potential source of bias is the exclusion of individuals residing in institutional care e.g. nursing home, hospital. Not including this subpopulation of older people in the sample could introduce selection bias into estimates of age effects on late life mental health problems. Increasing age is known to increase the risk of institutionalisation and research suggests that both anxiety and depression are more prevalent in nursing home and hospital settings (Smalbrugge et al., 2006).

A further methodological limitation is the inability to draw causal inferences due to the cross sectional study design. In a similar thread, the model applied is not capable of exploring the dynamic interaction between constructs or individual variables over time. There were also problems with the study sample, which was heterogeneous. The non-normality of psychopathology data suggests that the sample were not depressed or anxious in general. The sample was predominantly white, and relatively well educated which also limits the generalisability of findings. A larger sample including more older-old adults, and a greater variation in terms of education status, ethnicity and experience of psychopathology is required. Further, it was not possible to compare study responders with non responders, and as such this may have introduced bias into the sample.

The ordering of variables in the conditional process analysis requires careful interpretation. Although this was theoretically driven and based on the initial steps of the empirical analysis (correlation and regression), it is still limited to a somewhat linear analysis with one predictor and criterion at a time. Similar studies successful in recruiting larger samples (>200) may consider exploring how these constructs are related using structural equational modelling. This would allow for an analysis including multiple predictors and outcomes, as well as multiple mediators and moderators. Longitudinal studies may also consider exploring how these psychological variables unfold over time, throughout a period of naturalistic ageing.

Conclusion

The findings from this study suggest that interventions targeting psychological flexibility, engagement in valued living (such as ACT), and the use of SOC strategies may be an effective treatment in late life depression and anxiety. There may also be a role for this type of intervention to be adapted for individuals experiencing conditions which increase stress, and in turn increase their risk of developing a major depression or anxiety disorder. In this regard, the findings of this study support the further theorising of how to conceptualise change and adaptation in older people as part of a contextual behavioural science approach in the hope that this could offer avenues to explore practical guidance for targeting the influential relationships described in this data.

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APPENDICES

Appendix One: Author Guidelines for Clinical Psychology Review

Article structure Manuscripts should be prepared according to the guidelines set forth in the Publication Manual of the American Psychological Association (6th ed., 2009). Of note, section headings should not be numbered.

Manuscripts should ordinarily not exceed 50 pages, *including* references and tabular material. Exceptions may be made with prior approval of the Editor in Chief. Manuscript length can often be managed through the judicious use of appendices. In general the References section should be limited to citations actually discussed in the text. References to articles solely included in meta-analyses should be included in an appendix, which will appear in the on line version of the paper but not in the print copy. Similarly, extensive Tables describing study characteristics, containing material published elsewhere, or presenting formulas and other technical material should also be included in an appendix. Authors can direct readers to the appendices in appropriate places in the text.
It is authors' responsibility to ensure their reviews are comprehensive and as up to date as possible (at least through the prior calendar year) so the data are still current at the time of publication. Authors are referred to the PRISMA Guidelines (http://www.prisma-statement.org/statement.htm) for guidance in conducting reviews and preparing manuscripts. Adherence to the Guidelines is not required, but is recommended to enhance quality of submissions and impact of published papers on the field.

Appendices If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Abstract
A concise and factual abstract is required (not exceeding 200 words). This should be typed on a separate page following the title page. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list. Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and

multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Abbreviations Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Figure captions Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

References Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 1-4338-0559-6, copies of which may be ordered from http://books.apa.org/books.cfm?id=4200067 or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK. Details concerning this referencing style can also be found at http://humanities.byu.edu/linguistics/Henrichsen/APA/APA01.html

Citation in text Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard

reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Reference style References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication. **References should be formatted with a hanging indent (i.e., the first line of each reference is flush left while the subsequent lines are indented).**

Two: Author Guidelines for Journal of Contextual Behavioural Science

Types of article

All manuscripts must clearly and explicitly be of relevance to CBS. You may find the JCBS article "Contextual Behavioral Science: creating a science more adequate to the challenge of the human condition" helpful in assessing whether your manuscript is likely to be of interest to readers of this journal.

Articles should fall into one of seven categories:

1. Empirical research (up to 6000 words)
2. Brief empirical reports (up to 3000 words)
3. Review articles (up to 10,000 words)
4. Conceptual articles (up to 6000 words)
5. In practice (up to 3000 words)
6. Practical innovations (up to 3000 words)
7. Professional interest briefs (up to 3000 words)

Word limits exclude references, tables and figures but include the abstract

1. Empirical research. JCBS welcomes manuscripts across a breadth of domains from basic behavioural science to clinical trials. Research concerning the measurement and testing of process of change is particularly welcome. Potential methodologies include but are not limited to: randomized controlled trials, single case experimental designs, cross-sectional and prospective cohort studies, mixed methods designs, small scale analog studies. Papers reporting null findings are also welcome if their methodology is sound and their power sufficient. Authors of such papers will need to emphasize the implications of their findings for future research and practice.
2. Brief empirical reports. Manuscripts in this section may report preliminary, provocative or replicated results. Empirically sound methodology and adequate power remain important considerations.
3. Review articles. Manuscripts reviewing a wide range of topics are encouraged as long as their content is directly relevant to CBS. Systematic reviews and meta-analyses are particularly welcome. Authors are advised to consult relevant MARS (www.apa.org/pubs/authors/jars.pdf) and PRISMA resources (http://www.prisma-statement.org/) when preparing such manuscripts.

4. Conceptual articles. Manuscripts in this section should address conceptual or theoretical issues relevant to CBS. This may include papers that discuss relevant philosophical assumptions and traditions, or conceptual papers which explore aspects of or inconsistencies in contextual behavioural theory and science.
5. In practice. Manuscripts in this section are designed to make CBS useful to practitioners from a wide variety of areas. Manuscripts must be written in an accessible style and should be easily understood by practitioners who are not experts in research or basic behavioral science. Manuscripts should provide both clear insights for new practitioners as well as stating the questions that remain to be answered by future research.
6. Practical innovations. Manuscripts in this section seek to apply the findings and applications of CBS to under-studied, under-served or novel areas. The scope of these manuscripts is limited only by the journal's broad mission: creating a science more adequate to the challenge of the human condition.
7. Professional interest briefs. Manuscripts in this section highlight professional issues of relevance to those working in the field of CBS. Examples include manuscripts related to training and supervision, assessment methods in professional settings or opinions on contemporary issues.

Contact details for submission

To contact the Editor-in-Chief prior to your submission with any questions, please email ciarrochij@gmail.com

Appendix Three: Confirmation of Ethical Approval

Dear Victoria,

Application for Level 2/3 Approval

Project Title: Psychological Flexibility in an Ageing Population: Exploring the impact of age on factors of psychological flexibility, the use of Selection, Optimisation and Compensation strategies, and psychopathology.

Academic Supervisor: Dr David Gillanders/Dr Paul Graham Morris.

Thank you for submitting the above research project for review by the Department of Clinical and Health Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved on the 6th July 2015.

Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

Yours sincerely,

Kirsty Gardner

Administrator, Department of Clinical Psychology

Appendix Four: Participant Study Invitation Letter

NHS Borders and the University of Edinburgh

Dear Sir/Madam

My name is Victoria Thomson and I am currently a Trainee Clinical Psychologist in my specialist year in NHS Borders. As part of my final year of study I have chosen to specialise in older peoples' services and am required to complete a research project in the area of psychological well-being in later life. I write to invite you to participate in my study, which looks at how psychological processes change as we age.

Accompanying this letter is an information sheet which provides full details about the research study. Before deciding whether or not you are interested in participating, it is extremely important that you take a minute or two to read this so that you understand why this research is being conducted, what participation will involve, and who will benefit from the findings. Please feel free to discuss this information with others if you wish. I would also be delighted to answer any questions you may have about the purpose of the research or what is involved – my contact details can be found at the bottom of the attached information sheet.

I would like to take this opportunity to thank you for taking the time to read this letter and considering participating in this study.

Yours sincerely,

Victoria Thomson — Supervised by: Dr April Quigley

Trainee Clinical Psychologist — **Consultant Clinical Psychologist**

Appendix Five – Participant Information Sheet

Participant Information Sheet

Study Title: Psychological Flexibility in an Ageing Population: Exploring the impact of age on factors of psychological flexibility, the use of selection, optimisation and compensation strategies, and psychopathology.

Please read the following information carefully before you consider whether or not to participate in this research.

What is the purpose of this study?

The study will explore how a range of psychological processes change as we age. Specifically, the study is interested in changes in thoughts, values, and beliefs as people grow older. By understanding these processes, it is hoped that researchers will know more about mental health problems in older people.

Who should, and should not participate in the study?

We are interested in the views of people over the age of 55 in Scotland. However, if you have a dementia, or suffer from significant cognitive impairment, we would ask that you **do not** complete this questionnaire.

What is involved in the study?

If you agree to participate you will be asked to complete a short questionnaire pack which asks about your views on ageing, your beliefs and values, and your experience of worry, low mood or distressing thoughts. This will take approximately 15-20 minutes.

Do I have to take part?

No; participation is entirely voluntary, only you can decide whether or not to take part. If you agree you should complete the study pack and return this using the stamped addressed envelope. However, you can change your mind at any time by not returning the questionnaire, even after it is complete. However, after you have submitted your responses by returning the questionnaire, it will not be possible for you to withdraw from the study.

Are there any risks from choosing to participate in this study?

Some of the questions in this study may be upsetting for some people, although the risk of this is thought to be low. We do not anticipate any other risks to participants. However, sometimes our thoughts and feelings can overwhelm us. If you feel concerned that you are experiencing any distress, please contact your general practitioner. Alternatively, the following organisations can offer confidential support:

Borderline Helpline 0800 027 44 66

Open from 7pm to 10pm 365 days a year.

Borderline provides listening support to anyone experiencing emotional distress in the Scottish Borders area.

Breathing Space 0800 83 85 87

Open 6pm to 2am Monday to Thursday, and 6pm to 6am Friday to Monday.

Breathing Space offers a free, confidential phone service for anyone in Scotland experiencing low mood, depression or anxiety.

The Samaritans 08457 90 90 90 jo@samaritans.org (for support via email)

Open 24 hours 365 days a year.

Samaritans offer confidential, emotional support about whatever is getting to you. They also offer a support service via email.

Will there be any benefits to taking part in the study?

There will not be any direct benefits to you as a result of taking part in this study. However, you may feel positive in knowing that you have contributed to research aiming to understand more about how psychological processes change as we age. This information may offer the potential for the development of new interventions for older people experiencing psychological problems in the future.

Will my anonymity be protected if I choose to participate in this study?

This study **will not** collect any personal information such as your name, telephone number or address. Therefore, all information collected from questionnaire responses will be completely anonymous. No individual responses will be reported in this study, the only information shared will be statistics calculated to demonstrate average findings across all study participants.

What will happen to the results of the study?

This study will be written up as part of the researcher's Doctorate in Clinical Psychology qualification. The results may also be published in an appropriate peer-reviewed scientific journal for distribution to other professionals. Results of the study will also be provided to the community based groups involved in the project. Should you wish to register your interest regarding the results of the study, please contact the lead researcher using the information below.

Who has organised the study and who will review it?

Victoria Thomson, Trainee Clinical Psychologist in NHS Borders is undertaking this research under the supervision of Dr April Quigley, Consultant Clinical Psychologist within the Mental Health Older Adult Team in NHS Borders.

The study is being funded by the University of Edinburgh. It has been reviewed by researchers based in the University and by clinical supervisors in the participating NHS boards. With regard to ensuring participants' rights, safety and confidentiality, the South of Scotland Research Ethics Committee has reviewed the study.

Who can I contact for further information?

If you have any questions or concerns regarding this study please contact the lead researcher, **Victoria Thomson,** using the details below.

NHS Borders Mental Health Older Adult Service
Melburn Lodge, Borders General Hospital
Melrose
Telephone: 01896 827105

Alternatively, to speak to an independent person, please contact **Mr Mike Henderson,** Head of Psychological Services, via the telephone on 01896 826000.

For Complaints please contact **NHS Borders Feedback and Complaints Team** using the details provided below.

NHS Borders Feedback and Complaints Team
Borders General Hospital
Melrose TD6 9BS
Email: complaints.clingov@borders.scot.nhs.uk
Telephone: 01896 826719

Thank you for taking the time to consider whether or not to participate in this study.

Please Note: By completing and returning the questionnaire pack it is assumed that you are providing consent to participate in this study.

Appendix Six – Participant Consent Form

Participant Consent Form

Study Title:

Exploring the relationship between psychological flexibility & ageing:

A Contextual Behavioural Science approach.

Name of Lead Researcher:

Victoria Thomson - Trainee Clinical Psychologist (Specialist Year), Mental Health Older Adult Team, NHS Borders

Please read the corresponding participant information sheet before considering participating in the above study.

Please initial the following boxes:

I confirm that I have read and understand the information sheet dated (February 2015) for the above study and have had the opportunity to ask questions. ☐

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights being affected. ☐

I agree to take part in the above study. ☐

Signature: _____ **Date: _____**